COLOR PRINTERS: PAGE 168 • ELF REMEDIES? PAGE 83

MACWORLD

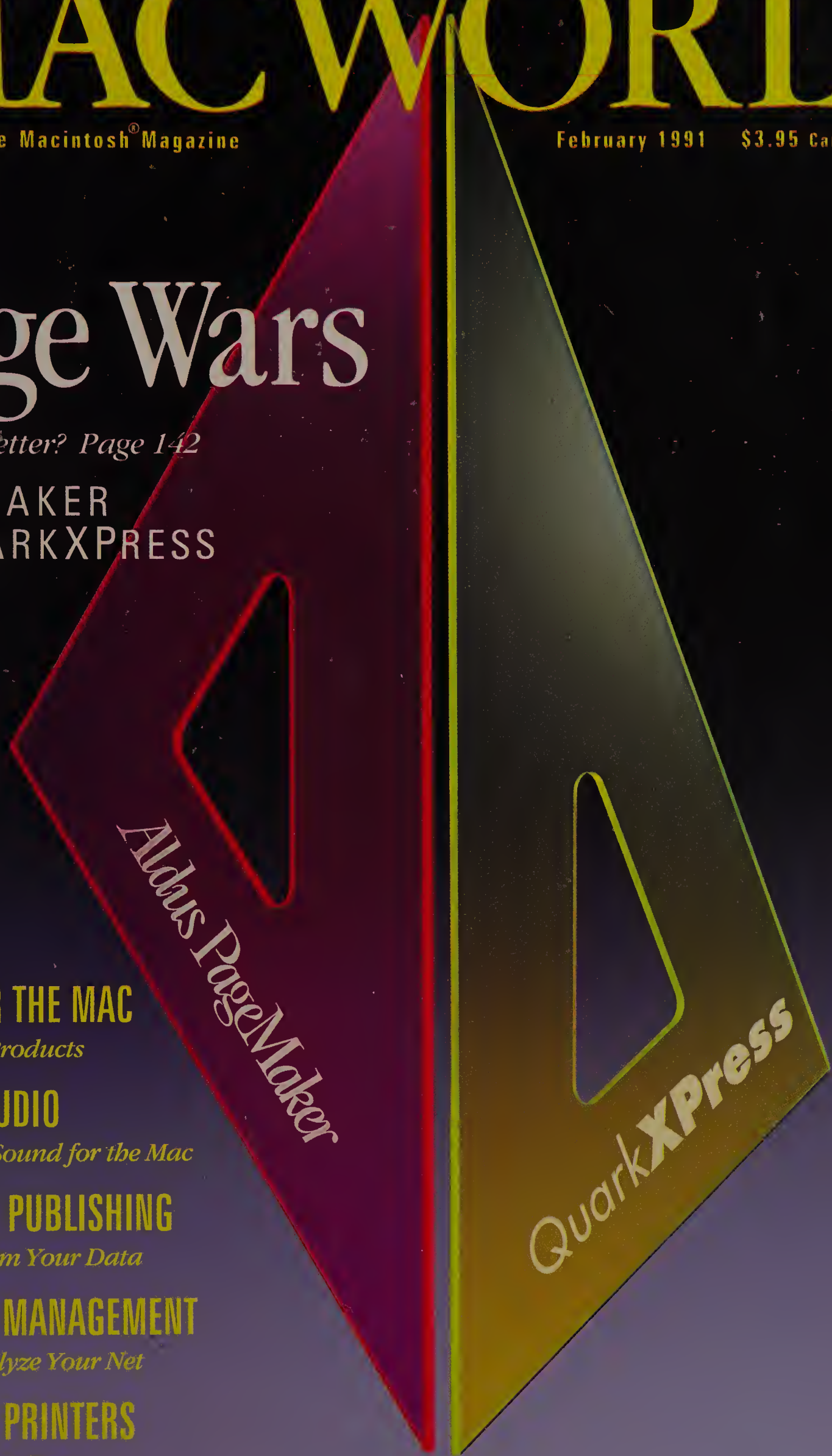
The Macintosh® Magazine

February 1991 $3.95 Canada $4.95

Page Wars

Which is better? Page 142

PAGEMAKER vs QUARKXPRESS



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14 COLOR PRINTERS

Macworld Lab Tests

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When we introduced Microsoft® Word six years ago, we weren't planning on making history.

We had just one goal, and a fairly simple one at that: to make a word processor that suited people's needs.

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CONTENTS

On the Cover
The most-asked question of Mac desktop publishers, "Should I buy PageMaker 4.0 or QuarkXPress 3.0?," is answered in our face-off, p.142. (Photo by David Bishop.)

In News
Aldus FreeHand 3.0 is being readied to do battle with its arch-rival from Adobe, p.113.

DEPARTMENTS

How to Contact Macworld 12

MacBulletin 17

Commentary/Jerry Borrell 23
In 1991 computers and video are combining to create new media.

Letters 37

Art Beat 69
By Cathy Abes

The Iconoclast 73
By Steven Levy Outbound's future is in Apple's hands.

Conspicuous Consumer 83
By Deborah Branscum Behind the Champ Polar Filter.

State of the Mac 103
By Bruce F. Webster From calibration to color matching systems.

News 113
By Dan Littman and Tom Moran

New Products 251

How To/Quick Tips 263
By Lon Poole

How To/Getting Started with Power Protection 275
By Jim Heid

How To/Insights on QuarkXPress 3.0 283
By Diane Burns

Updates 293

Where to Buy 299

Best-Sellers 352

FEATURES

Page Wars 142

By Steve Roth PageMaker 4.0 or QuarkXPress 3.0—which should you buy? We put these page-layout leaders to the test in a feature-by-feature comparison that pinpoints each one's strengths and weaknesses.

Managing Networks 152

By Dave Kosiur Armed with the right network-management tools, you can tune up any size network and keep it running smoothly.

Digital Audio at Last 160

By Christopher Yavelow The desktop audio revolution is ringing in a new era in affordable CD-quality sound on the Mac.

Color Printers Here and Now 168

By Charles Seiter As features and quality go up and prices come down, making a purchase decision gets trickier. Macworld Lab tests 14 color printers to target the best buys in today's crowded market.

Mac Video, Take II 178

By Peter S. Marx and Franklin N. Tessler In this update to last September's report, we look at what's new in Mac-based video to find out if the Mac is ready for a starring role in video production.

Publish Your Database 184

By Jim Heid Merging data and design may seem like a daunting task. But use the right combination of database and page-layout tools and you'll get high-quality results—everything from mailing labels and lists to catalogs and directories.

Color Printers Here and Now
The time has never been better to invest in color output, p. 168.

Reviews
The long-awaited Illustrator 3.0, p. 196; Art Beat, p. 69, shows how it was used to create this illustration.

REVIEWS

Adobe Illustrator 3.0 196
Design, page-layout, and production software.

Switchboard 198
Modular keyboard.

Business LaserPrinter IIS and QMS-PS 410 200
Two PostScript page printers.

Timbuktu/Remote Access Pack .. 204
Remote access to your Mac.

Rival 1.1.4 and SAM (Symantec AntiVirus for Macintosh) 2.0 211
Antivirus utilities.

The Norton Utilities for the Macintosh 1.0 213
Disk utilities.

Nisus 3.01 215
Word processor.

Go Junior 218
Go tutorial software.

Playmaker Football 1.0 220
Football strategy game.

ClickChange 1.01 and Personality 1.0.1 222
Customizing utilities.

WPduet 224
File-transfer kit for Tandy WP-2.

FileMaker Pro 226
Database manager.

Typist 231
Hand-held OCR scanner.

Bernoulli Transportable and Microtech R50 234
Removable-media drives.

Plottergeist 1.0 236
Chooser-selectable plotter driver.

Window Shopping 239
The Macintosh Bible Software Disks, Third Edition; Kiwi-Finder Extender 1.02; Astrix 1.0; MacSleuth 1.0; Word Count DA 1.2; Cataloger 1.01; TrackMate 1.0; Quality Artware; Keyboard Shelf.

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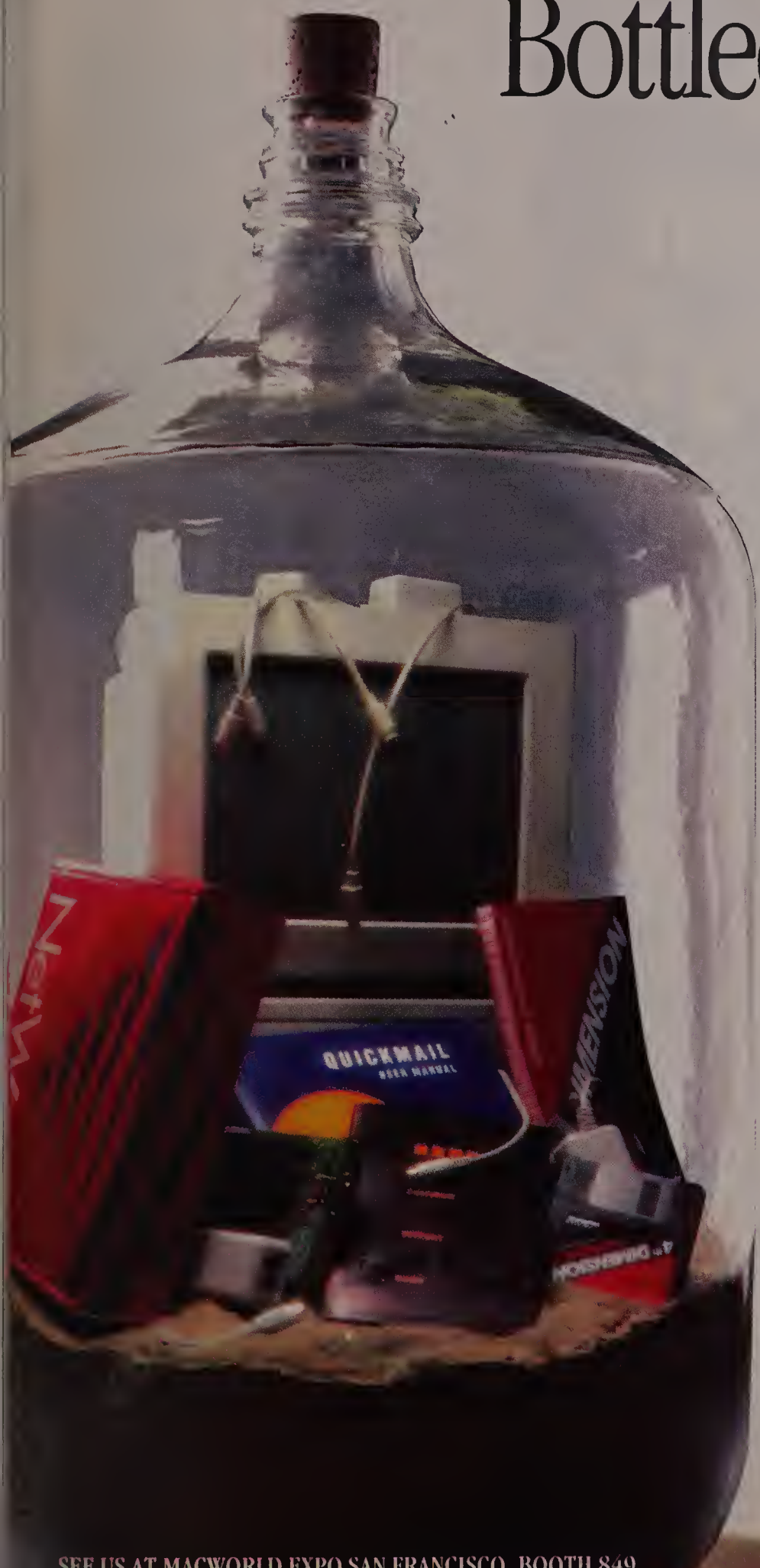

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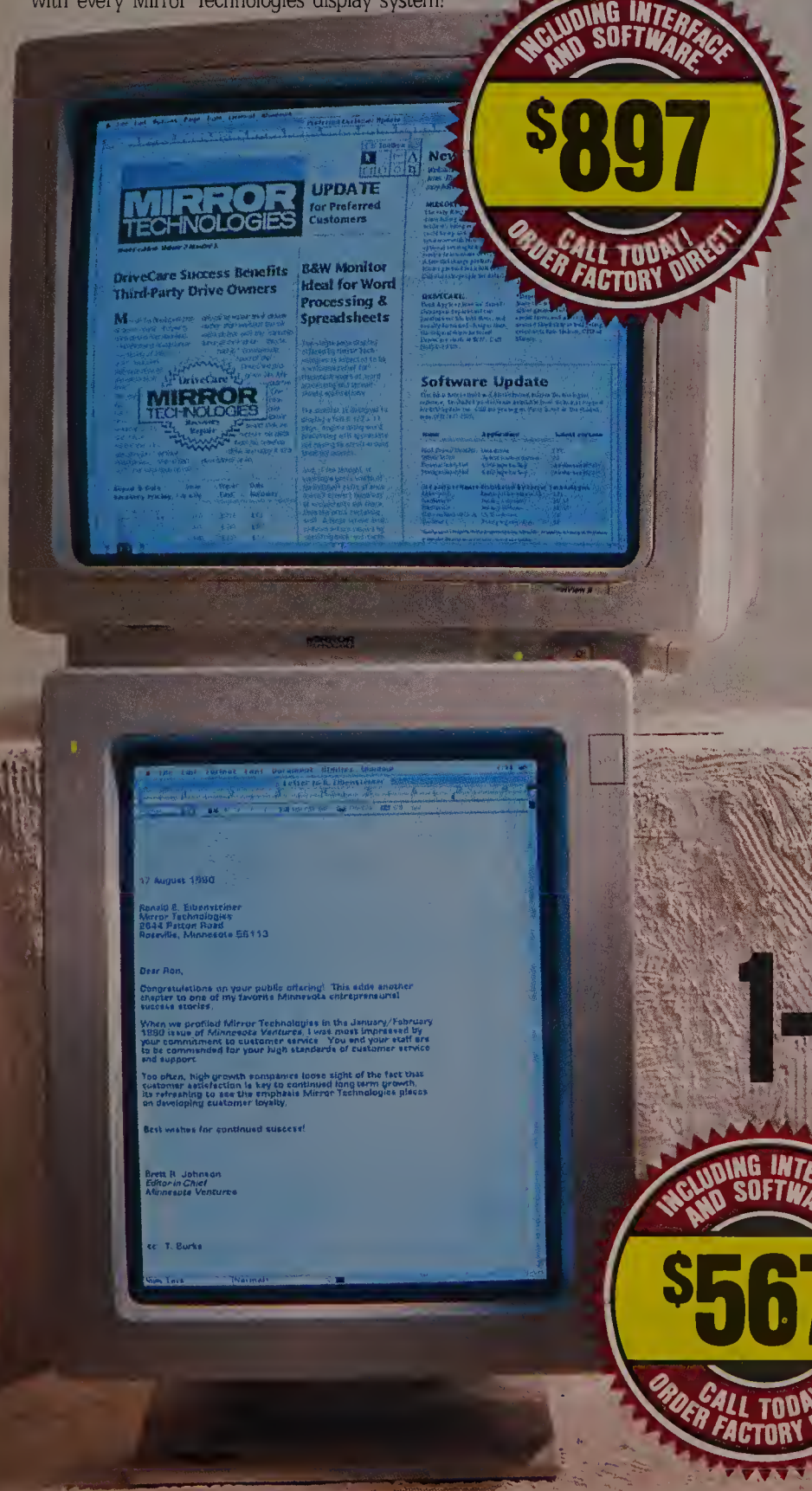

Make The Right Choice!

	PixelView I	PixelView II	ProView 8	ProView 24
Display type	1-bit mono	1-bit mono	8-bit color	24-bit color
Screen size	15"	19"	20"	20"
Viewing area (sq. in.)	90.77	151.58	151.58	151.58
Resolution (dpi)	80	72	72	72
Vertical refresh	75	78	75	74
Pop-up menus	Yes	Yes	Yes	Yes
Enlarged menubar	Yes	Yes	Yes	Yes
Enlarged cursor	Yes	Yes	Yes	Yes
Screen saver	Yes	Yes	Yes	Yes
Screen copy	Yes	Yes	Yes	Yes
Full year warranty	Yes	Yes	Yes	Yes
VideoPaint	No	No	Yes	Yes
DeskPaint v1.5	Yes	Yes	No	No
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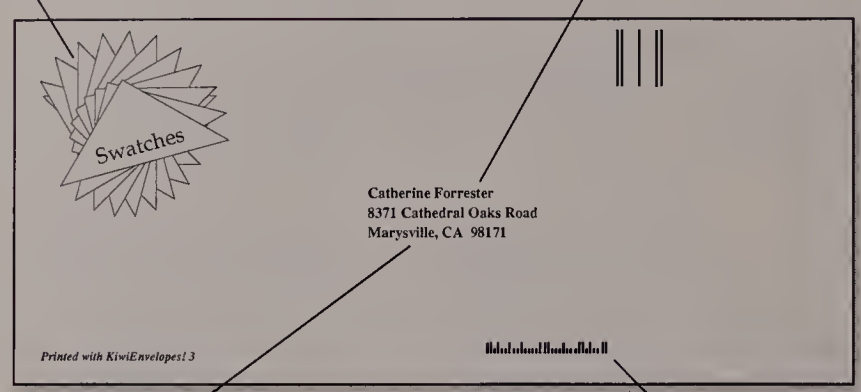

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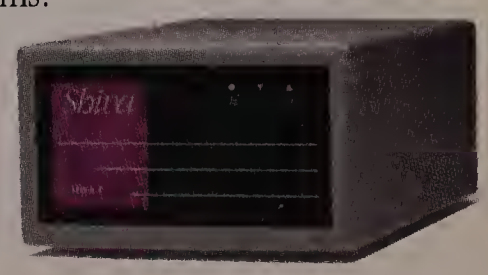

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Steve Rennie, President of REN Management Corporation

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"FASTER THAN A SPEEDING BULLET."
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—MacWorld

"IN A WORD, IT'S A GEM."
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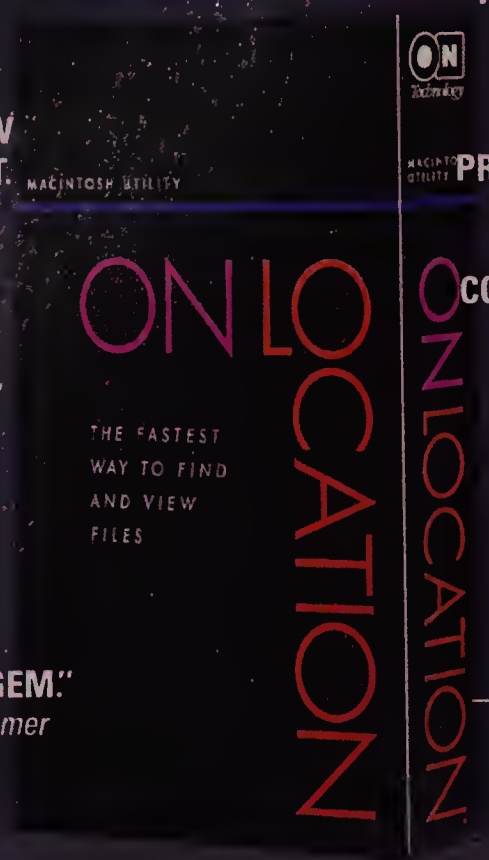

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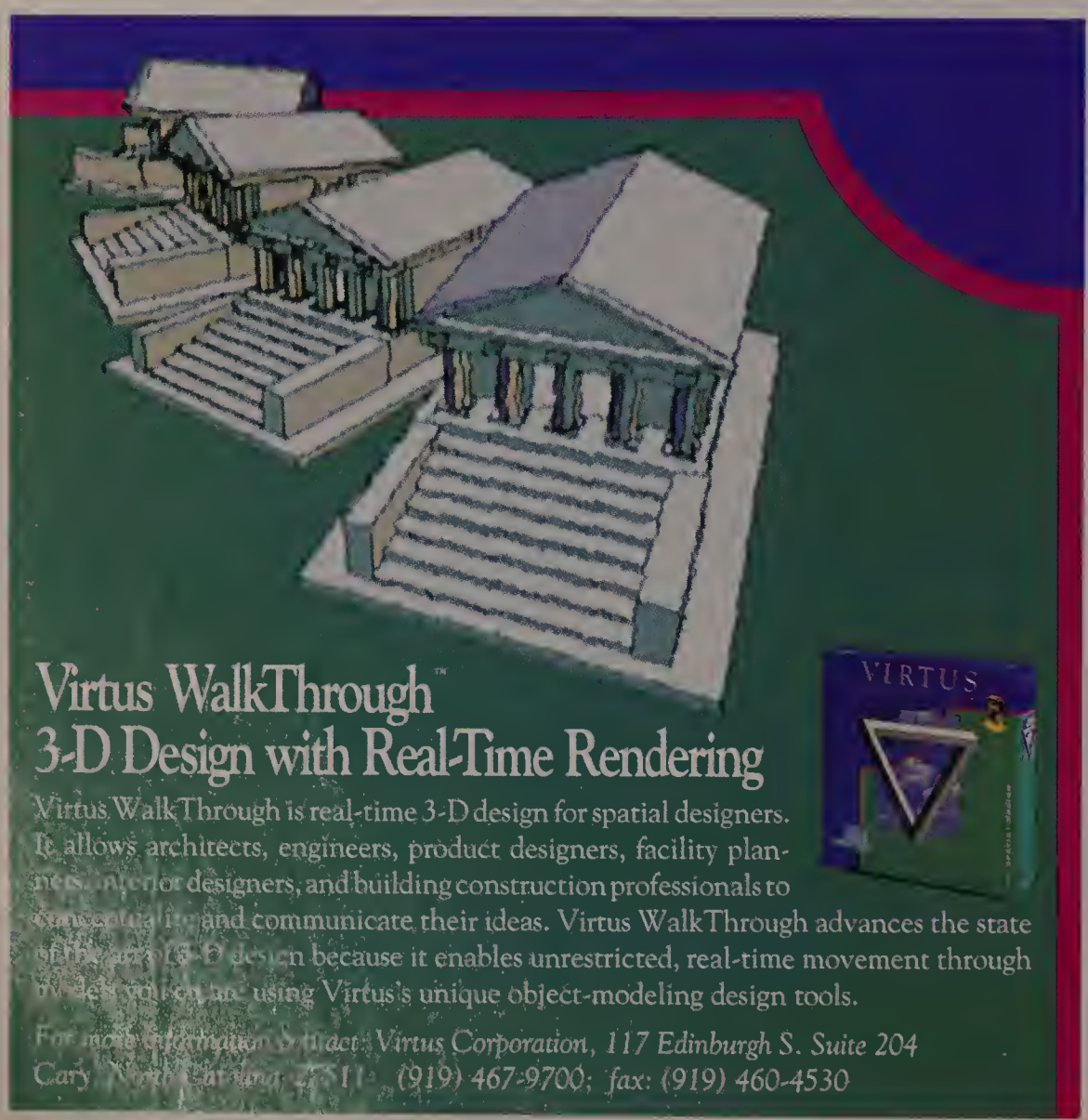

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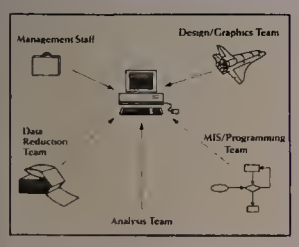

Take a deep breath and consider—HiQ has the richest and most extensive function library of any engineering program. Over five hundred robust built-in functions right at your fingertips. Features and capabilities not available in any other commercial product. Many of the most powerful microcomputer mathematics programs in the world. And HiQ also gives you the flexibility to design your own tools. Imagine having the power and the ability to design and use a specialized engineering tool you've created—in a single day.

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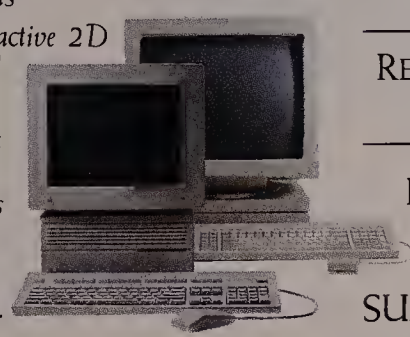
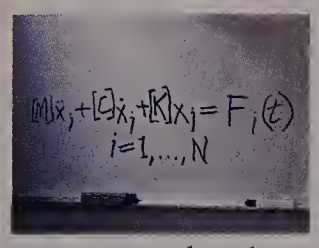


Plus several higher level capabilities. For instance, HiQ's numerical editor enables you to determine both the structure and mathematical characteristics of any matrix of any size. The Optimizer contains linear programming, nonlinear unconstrained and constrained programs based on the best available algorithms successfully used on scientific mainframes. The Fourier and Statistical Analyzers have been developed and tested by specialists in those disciplines. And the



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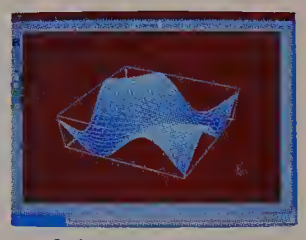

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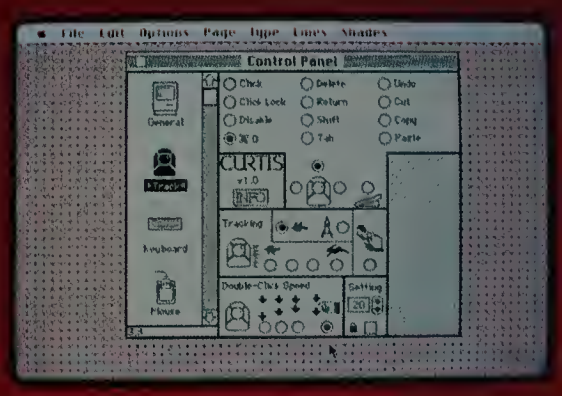

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MACBULLETIN

Apple Ships Initial LCs, Orders for Classic Outstrip Supply

The first Macintosh LCs have been shipped to dealers, and Apple has added the computer to its official price list. However, the first shipments are likely to be used by dealers as display models, with volume shipments still scheduled to take place in late January. Meanwhile, due to unexpected demand, the Classic was still in short supply at press time, with even the largest dealer chains on allocation. Apple has put on three shifts at the Singapore plant where the Classic is made, and is adding a production-line factory in Cork, Ireland.

Motorola Claims First Shipments of the 68040

After several production delays, Motorola announced in late November that it had begun initial volume shipments of the powerful 68040 microprocessor, which Apple has confirmed will be the heart of a future Macintosh. The 25MHz chip, also designed into workstations by Hewlett-Packard and Next, is rated at 20 MIPS by Motorola, making it several times faster than even the 40MHz 68030 used in the Macintosh IIfx.

MicroPhone Goes Interactive

MicroPhone II version 4.0's interface builder, Dialoger Pro, adds support for interactive dialog boxes that can respond to values entered by users—for example, disabling check boxes or OK buttons—and can create floating palettes, modeless dialog boxes, and scrolling text fields. Scripters will find a full text-editor for writing scripts in 4.0 (the earlier script editor is also available). The expanded command set can, among other capabilities, read MicroPhone's timer and manipulate long (32,000-character) strings. Through Apple's Comm Toolbox, version 4.0 will support DECnet, TCP, multiport cards, and internal modems. MicroPhone II's price remains $295. For more information, contact Software Ventures at 415/644-3232.

In Focus Shows Thin-Panel Color Display for Mac II

In Focus Systems has designed a thin-panel display for the Mac II family. Intended in part to make Mac IIs more transportable, the lightweight LCD panel can display nearly 5000 colors on screen. Called the 5000M, the 10½-inch display refreshes at a rate of about 14 frames per second, acceptable for presentations, but slow enough that the cursor can sometimes "ghost" or disappear. The company expects future upgrades to achieve a rate of 30 frames per second. The device is scheduled to ship to OEMs in the first quarter. Its retail price was not set at press time, but the company says the target price is $2500. For more information contact In Focus at 800/327-7231 or 503/692-4968.

Bug Report

Two big-selling programs have been drawing reports of bugs and crashes. CE is not sending QuicKeys² version 2.0.1, the second QuicKeys² bug-fix, to users but the update is available on most online services or by calling CE at 515/224-1995. Claris, whose FileMaker Pro has reportedly scrambled databases, had not decided on a ship date or distribution method for a FileMaker Pro bug-fix by press time. For more information, call Claris at 408/987-7000.

Quantum Acquires La Cie

Peripherals vendor La Cie was acquired by Plus Development, which is a wholly owned subsidiary of hard-drive manufacturer Quantum Corporation. La Cie will operate as a separate entity and will standardize on Quantum drives in the capacities that Quantum manufactures. However, La Cie will continue to sell high-capacity drives from other drive makers. Joel Kammerman, La Cie's longtime president, will remain as general manager.

On Technology's New Plan

Meeting Maker is a new group-calendaring tool. Each user stores a calendar on the server, and Meeting Maker coordinates calendars as groups plan meetings and agendas. When you propose a meeting you can pick mandatory and optional guests and let Meeting Maker set the time (you can also pick times manually while looking at blocked-out times—but not activities—on other users' calendars.) Meeting Maker keeps track of who can attend and informs attendees when a meeting is cancelled or moved. Pricing was undecided at press time. For more information, contact On Technology at 617/876-0900.

Mobius to Unveil SE Display/Accelerator Board

Mobius Technology has announced its Mobius One Page 030 Display, a combination of a 15-inch monochrome portrait display and the company's Mobius APD 030, a display board that's also an accelerator for the SE. The board supports a resolution of 640 by 860 at 75Hz and 78 dpi. It also works with the Apple Macintosh Portrait Display and compatible monitors. The APD 030 board incorporates a 25MHz 68030 processor for acceleration and 1MB of RAM (expandable to 16MB).

(continues)

The board and monitor together will retail for $995, while the basic APD 030 board by itself will carry a retail tag of $595. Both the bundled subsystem and the separate display/accelerator board are slated for shipment on January 15. For more information, contact Mobius at 800/669-0556 or 415/654-0556.

Bitstream Up with the Times

Bitstream is upgrading its entire library of 1000-plus typefaces to PostScript Type 1 compatibility. The new fonts will be hinted but not regularized; will be compatible with Adobe Type Manager; and will have industry-standard names that avoid conflict with other vendors' fonts. For more information, call Bitstream at 617/497-6222.

ModaCAD's 3-D Look

Fashion-design software vendor ModaCAD is branching out with software that stands up. ModaVision System is a general-purpose 3-D modeling and rendering package that creates stereo screen images; wearing ordinary 3-D glasses, users can model objects that appear to project out of the monitor. Another new ModaCAD product called Envision can map new surface patterns onto scanned images—for example, replacing the upholstery in a car—while retaining highlights, folds, and other characteristics of the original surface. ModaVision lists for $5989; Envision lists for $1989. Both products are hard-key copy-protected. For more information, contact ModaCAD at 213/312-6632.

New OCR for Mac

OCR Systems' first Macintosh product has some unusual features. ReadRight 2.01 is an intelligent ("omnifont") package that can separate images from text and save them as TIFF files; supports linking text blocks to keep recognized text in order; can use templates for reading forms; and keeps track of double-sided pages. It comes with a spelling checker and lists for $495. For more information, contact OCR Systems at 215/938-7460.

Air Mouse Controls the Mac from Afar

An infrared pointer that can control a Mac or a PC from across the room should be available in the first quarter from SelecTech Ltd. Called Air Mouse, the device consists of a one-button remote control–like unit and a base unit that sits on or near the computer. The base unit, which will connect to a Mac ADB port, constantly senses the position of the hand-held pointer and registers a mouse event when the user pushes the button on the pointer. The Air Mouse will have a retail price somewhere between $450 and $500. For more information, contact SelecTech at 802/860-7600, 714/494-1400 on the West Coast.

Deneba Opens Architecture

Deneba's Canvas 3.0 will have an open, plug-in-module architecture like that of the company's UltraPaint. The drawing program's new version also supports Pantone colors; the ability to manipulate multiple points of a bezier curve at once; text with fractional leading, slanted margins, and text-wrap around irregular objects; and for architects, hatching and curved- and straight-wall tools. The price remains $395. For more information, call Deneba at 305/594-6965.

Software Vendors Hear the Music

A would-be VAR files a $2,695,000 lawsuit against Oracle alleging that the database giant makes deals it can't honor. A Dataquest report rips Oracle and other vendors for manipulating stock prices. Well-deserved bad publicity like this is driving the software industry to regulate itself; a first step is the recently established Software Business Practices Council (SBPC). Cognos president and SBPC chair Jeff Papows says the SBPC will deal with three issues: "vaporware; competitive product claims—unfair apples-to-oranges comparisons; and financial reporting practices." Few Macintosh companies have joined the Council. For more information, software developers should contact Papows's office at 617/229-6600.

Sitka's Data Saver

TOPS publisher Sitka is developing a $139 utility that creates a trail of document versions and helps prevent overwriting files. Versionary duplicates a file and appends a version number to its name each time you save. You can control what and where it saves, set how many versions it keeps, and automatically compress copies. It is not appropriate for use with multiuser or transaction-processing databases. For more information, contact Sitka at 415/769-9669.

Law Bans Software Rental

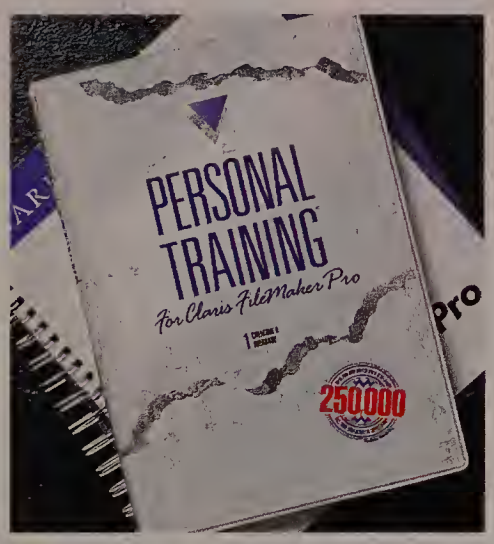
A new law prohibits renting software without permission from the copyright holder. According to the Software Publishers Association's counsel Mary Jane Saunders, the bill's wording could cover software retailers who accept returns on software (except returns authorized by the publisher). Saunders said the SPA, which lobbied for the bill, "probably wouldn't go after" dealers accepting returns, which often carry a hefty 25 percent fee.

Next Year's Model

Changes in ModelShop give the 3-D sketching tool some practical CAD features. In version 2.0 you can draw on planes at any angle—not just parallel to the ground—and with Z-buffered rendering the program can properly render intersecting objects. The new version supports contour-mapping and can split the background (for example, to show earth and sky), has multiple independent lights and shadows, and can show 24 shaded or ramped colors. ModelShop 2.0 also provides a text tool for labeling objects; PICS support for creating animations; and DXF import and export to make up for its lack of dimensioning capability. Version 2.0 will list for approximately $750. For more information, contact Paracomp at 415/956-4091. ■

Four Ways to Recognize a More Productive Mac User

The most obvious sign is the PTS package — usually on top of software manuals that no longer have to be read.



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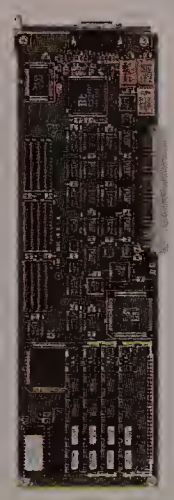

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The Future of Television and Computers

IN 1991 COMPUTERS AND VIDEO ARE COMBINING TO CREATE NEW MEDIA

BY JERRY BORRELL

As I sat one evening in my office, looking at the bridge that connects San Francisco to Oakland and its thousands of tiny lights, one of my monitors caught my attention. The 13-inch Apple display was playing the evening news, courtesy of my RadiusTV adapter, when the local NBC affiliate announced that Saddam Hussein planned to increase troop strength in Kuwait to nearly three-quarters of a million soldiers—heightening the likelihood of war. (A cheery Christmas prospect that I might not otherwise have heard about with my irregular work schedule.) Espying a commercial, I adjusted the channel for PBS and MacNeil/Lehrer, where I heard a discussion by several analysts pondering how America will react to Iraq's upping the ante. I am struck by the fact that our country is facing a war that, even before it begins, is of a larger scale than the majority of the Vietnam War.

If the technology had been available, I would have sent a segment of the broadcast to the editors and designers here at *Macworld* via our QuickMail system. It made me ponder the moment when I will use this technology to create interactive documents, incorporating video, to create memos or editorials that people will watch in new ways. Documents that will improve the current state of television, which turns, in Tom Brokaw's words, television commentators into talking dummies. And which turns, in my mind, the mass of our society into head-nodding sheep.

I expect to be writing or, more aptly, creating such documents in 1991.

Video Products

It all started with the bright idea of hooking up a video source to the Mac. Aapps, a company in Sunnyvale, California, must be recognized for accomplishing this first, with its MicroTV board, and for its idea of keeping it cheap. (Products from Mass Microsystems and Truevision, pioneers in their own right, were very expensive.) The first monochrome board was no wonder of technology, but it was a pioneering product. The Aapps professional board with color, DigiVideo Color, was closer to the mark.

The first Aapps board nevertheless caused many people to ask, What am I going to do with it? Frank Brooks, the president of Aapps, sat opposite me one day bemoaning the fact that people didn't get it. Companies with security guards watching a TV next to a computer monitor didn't get it. Real-estate agents with huge picture databases or videotape libraries of houses didn't get it. Educators didn't get it. Business types working late in their offices on computers didn't get it. The boards didn't receive the recognition in the market that they deserved.

One reason that people didn't get it was because the world of video has been beyond the average user's grasp, in terms of expense and complexity. The Aapps products changed that world. It's simple. Put a NuBus board in your computer. Hook up the board

to a set of rabbit ears (that's what I use) or a VCR. Start it up, install an INIT and a DA, restart, and begin looking at television in a window on your Mac.

Then came the RasterOps board that had more sophisticated software—more features, including grabbing and storing frames (even groups of frames). Then came RadiusTV (and more expense, unfortunately) with even more features and a sexier interface. And Radius Theatrics software made it possible for *Macworld* to quit going to a service that had been taking three days to make video screen grabs into PICT files for the magazine—something I was able to accomplish with Theatrics in three minutes. I think you can imagine what that means in terms of simplicity. We're talking easy, as in a word processor is more painful to learn.

I'm not telling the entire truth. All the video boards leave nasty little pixels displaced on the screen in some irritating way—we politely call them artifacts and we don't say that the video boards are still buggy. And I

(continues)

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don't mention that my RadiusTV board won't work with my SuperMac 19-inch monitor. And don't even ask whether my Radius board will work with my RasterOps board—we're talking ugly system crashes.

But if you're careful about how you mix products, the results are exciting. So I took my RadiusTV to a presentation for several company presidents and was able to connect the hotel's cable to my Mac and pop up a window with FNN (Financial News Network) running. FNN keeps a video display of the stock ticker running at the bottom of the television screen. The presidents got it.

> BY 1992, VIDEO, TYPE, DATA, IMAGES, AND SOUND WILL COMBINE IN WAYS WE'RE ONLY BEGINNING TO IMAGINE

Even Apple has discussed incorporating video capability in its system software. But displaying pictures on expensive monitors is not an effective use of computer monitor technology.

Sending Images

I wanted to capture a segment of a news broadcast and send it as an E-mail, but I came up short. I decided to grab a screen via the Clipboard and paste it into my editorial column, but still came up short. (Dialog box hell informed me that the Clipboard had a file requiring too much memory to allow the paste function to work with my word processor.)

Farallon is working on a product called DiskPaper that goes a step beyond Solutions Inc.'s Glue. DiskPaper can open any kind of file without the origination application. Unlike Glue documents, DiskPaper files can be edited; they are "living" documents that carry text and graphics attributes along with them wherever they go. That will help in sending documents to other computers, the sort of work that Apple's system software should have allowed years ago, but I wanted to use QuickMail.

Eventually I figured out that I had to send a single frame of the broadcast as an enclosure to a message and thus avoid the Clipboard. So I sent it to Dennis McLeod, our design director. And lo, some 25 minutes later the file appeared on his desktop (good thing I do this stuff at night). All right, so I won't be working with the new media tonight. Not until we have . . .

Image Compression

Two years ago a company called C-Cube was founded by a Silicon Valley wizard named Ed Sun, with the intent of creating specialized chips that compress images into small files—images reduced according to the JPEG (Joint Photographic Experts Group) standard, 20 or more times smaller than their original size. C-Cube created the chips and even built NuBus boards to house them, but just as the company began to convince companies (companies other than Apple that build high-performance workstations) to implement the chips, Macintosh developers began to figure out how to implement compression without any specialized hardware. There is now a product from Radius called ImpressIt that can compress an image by 10 to 1 or 15 to 1 in an instant without the need for expensive hardware. And other products will follow.

You'd think it couldn't get any better, but these developments address only part of the problem I raised earlier. Remember, I said I wanted to send video clips. Farallon is working on sending what it calls movies, but the company is talking about the ability to replay a series of screen operations and accompanying annotation, which is useful in conferencing, support, and education.

But single video images or groups of video images are different. One second of video equals 30 still frames, requiring some much fancier image compression, based on another standard—MPEG (Motion Picture Expert Group). However, as you might guess, C-Cube and others are hard at work on schemes for compressing and decompressing video in real time. SuperMac, for example, was showing *Who Framed Roger Rabbit?* at last August's Expo, decompressed in real

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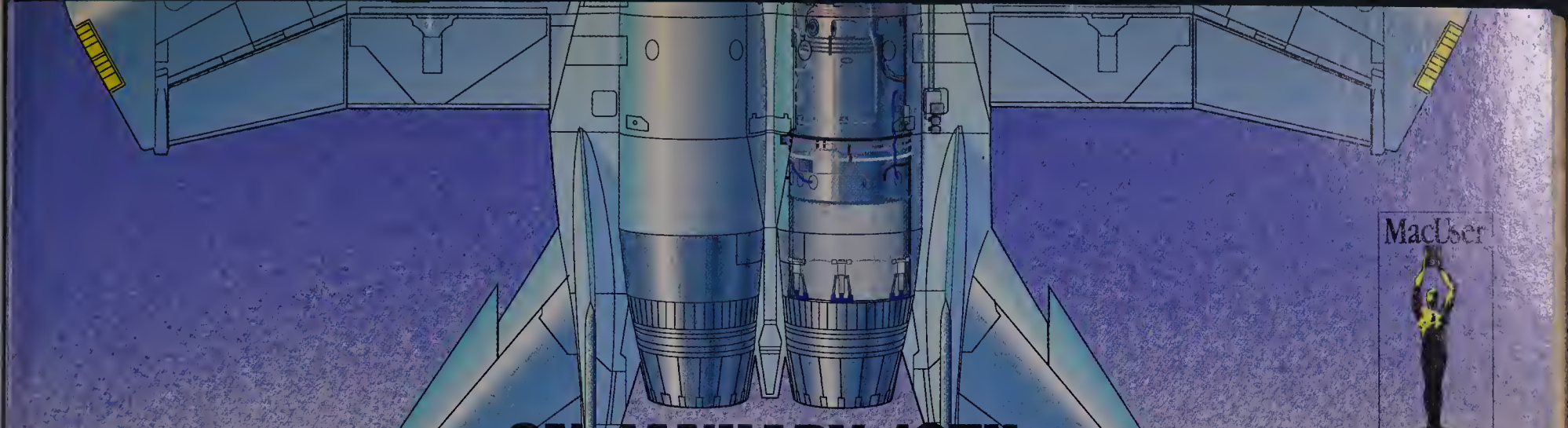

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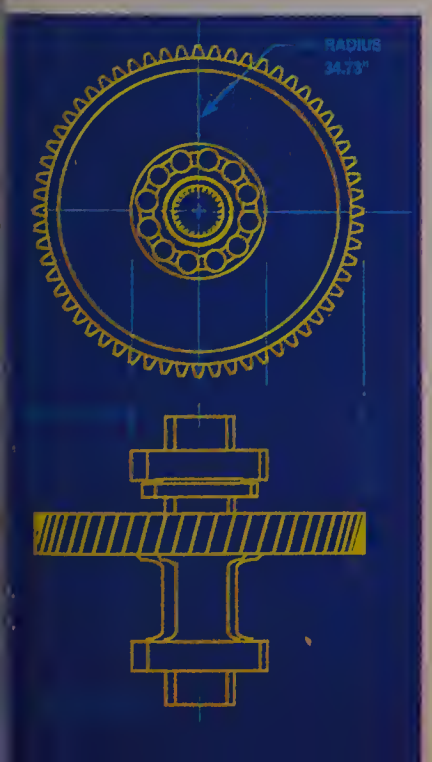

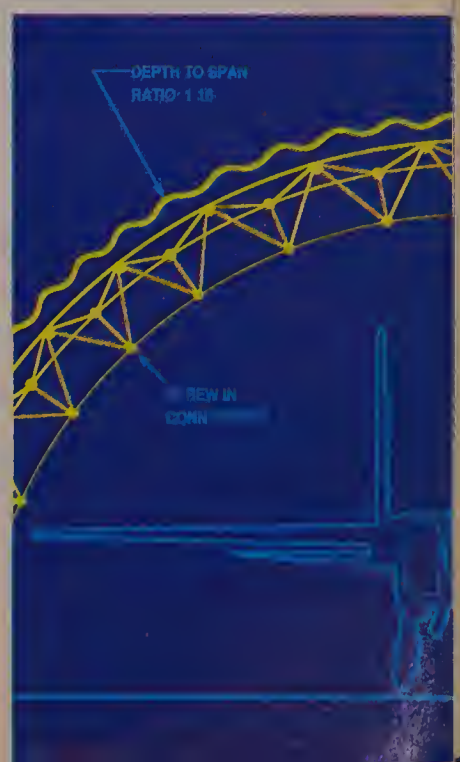

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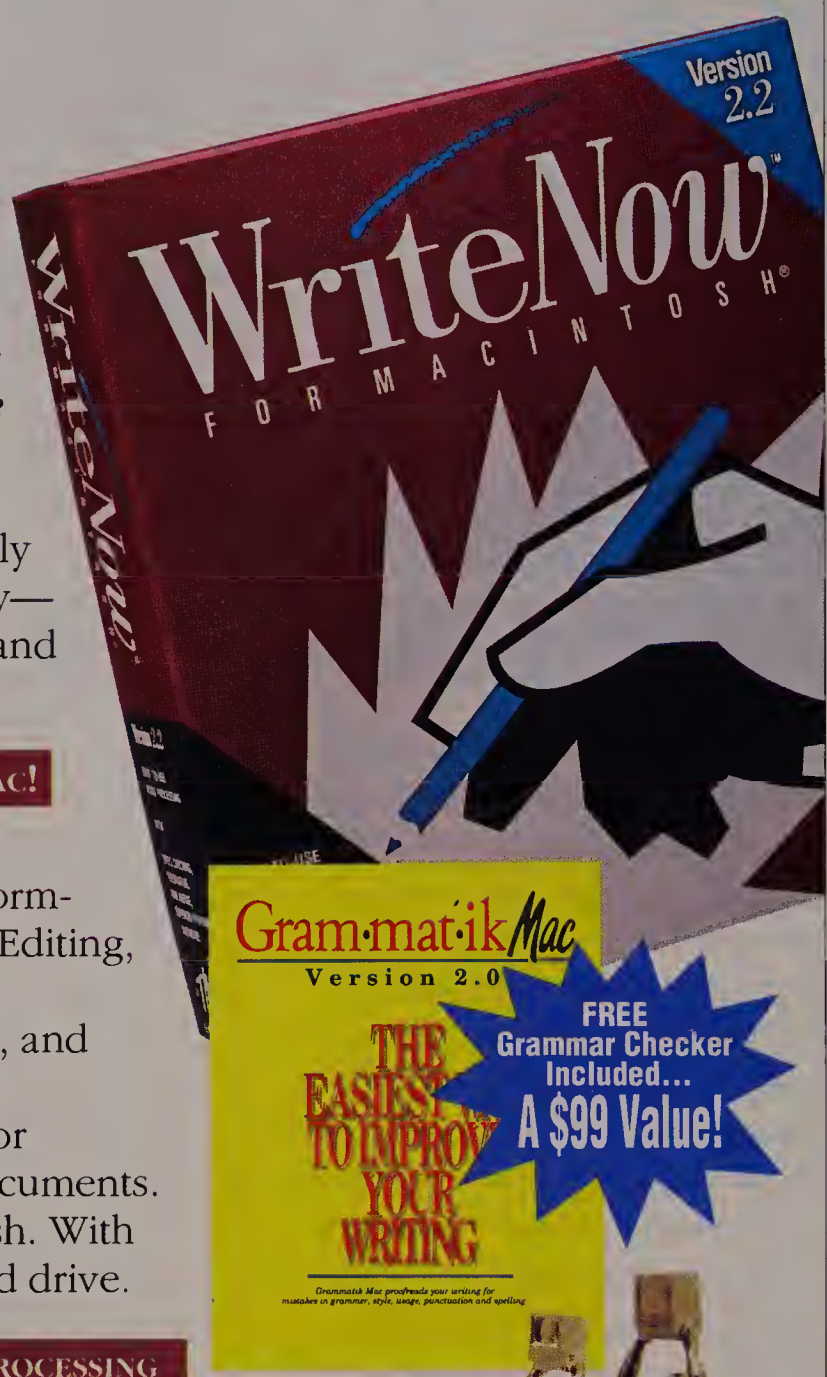
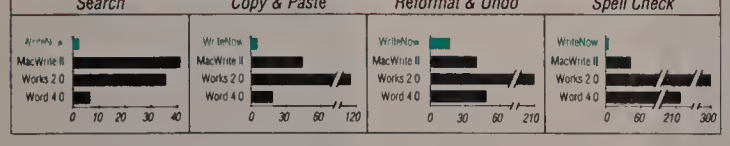


Quick Comparison of Leading Word Processors

	WriteNow 2.2	MacWrite II	Works 2.0	Word 4.0
Disk space needed:	(2) 800K*	Hard disk	Hard disk	Hard disk
Thesaurus *(Size in responses)*:	1.4 million	220,000	No	220,000
Spell Checker *(Size in words)*:	135,000	100,000	60,000	130,000
Grammar Checker *(Bundled)*:	Yes	No	No	No
Retail Price:	$199	$249	$295	$395

Speed Comparison Charts *(in seconds)*



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time from a large hard drive connected to one of its video displays.

Until we get real-time compression in commercially available products, the new media won't happen, because just as single images are vital to print, video images are vital to new forms of media.

Special Effects

Last summer saw the announcement of several NuBus boards, such as the one from Explorer, that incorporate software (actually firmware) that enables the Macintosh to perform special effects on still frames, an ability formerly seen only in expensive systems for professional video-production suites. Effects such as twisting video frames 360 degrees in 3-D space, based on quaternion mathematics.

Those boards were being announced just as companies such as Avid and Digital F/X were announcing progress in integrating complex video-editing systems around the Macintosh. Boards that, when combined with software applications, give the Macintosh professional video-production capabilities at relatively lower cost. Software such as Thomas and John Knoll's Photoshop, sold by Adobe Systems. John, a special-effects artist at Lucasfilm's Industrial Light and Magic subdivision, wanted a digital matte system that would allow him greater freedom to create elaborate backgrounds for the filmmaking process. So he talked his brother, a doctoral candidate at UCLA, into writing the program that became Photoshop. The kind of program that until recently could only be found for tens of thousands of dollars.

Photoshop, while a magnificently useful program, is not intended for the video environment (at least not yet). That missing part of the puzzle for the new media comes from a company called Light Source, where Mike Solomon (a cofounder of Aldus), Rob Cook (who wrote a host of algorithms while at Lucasfilm and Pixar) and Ty Roberts (who helped write Jam Session) are developing a video-editing product for the Mac that will have few rivals in any environment. The most important aspect of the Light Source project is the fact that this software, *(continues)*

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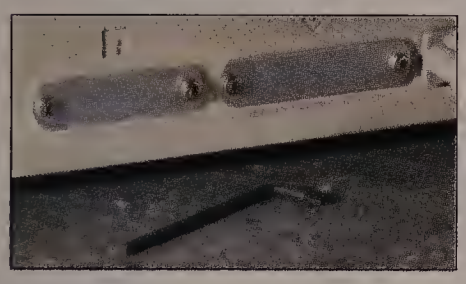

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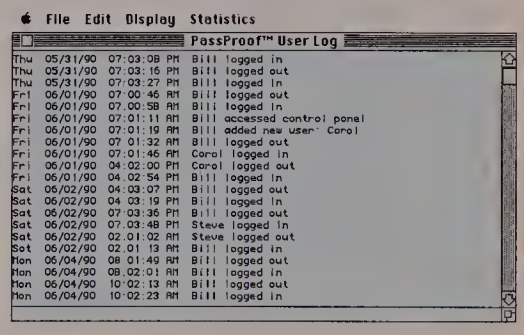

File Edit Display Statistics

PassProof™ User Log

Thu	05/31/90	07:03:08 PM	Bill logged in
Thu	05/31/90	07:03:16 PM	Bill logged out
Thu	05/31/90	07:03:27 PM	Bill logged in
Fri	06/01/90	07:00:46 AM	Bill logged out
Fri	06/01/90	07.00:58 AM	Bill logged in
Fri	06/01/90	07:01:11 AM	Bill accessed control panel
Fri	06/01/90	07:01:19 AM	Bill added new user' Carol
Fri	06/01/90	07 01:32 AM	Bill logged out
Fri	06/01/90	07:01:46 AM	Carol logged in
Fri	06/01/90	04:02:00 PM	Carol logged out
Fri	06/01/90	04.02:54 PM	Bill logged in
Sat	06/02/90	04:03:07 PM	Bill logged out
Sat	06/02/90	04 03:19 PM	Bill logged in
Sat	06/02/90	07:03:36 PM	Bill logged out
Sat	06/02/90	07.03:48 PM	Steve logged in
Sat	06/02/90	02.01:02 AM	Steve logged out
Sat	06/02/90	02.01 13 AM	Bill logged in
Mon	06/04/90	08 01:49 AM	Bill logged out
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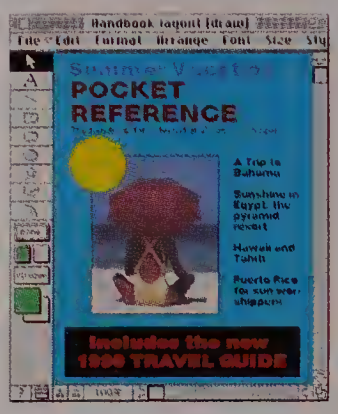

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while sophisticated, will be affordable and relatively easy to use. The company also has a strategic relationship with NEC, which will sell a subset of the software for use with the NEC PC-VCR, a frame-accurate SuperVHS video recorder that, when connected to the Mac and driven by Light Source software, will give new meaning to the phrase *home video.*

Documentary filmmakers the world over will have reason to rejoice when they are freed from the tyranny of renting time in central video-production facilities, and when they will be able to produce broadcast-quality video with an affordable, Macintosh-based editing system. We're talking under $10,000—including the Mac, software, monitor, two tape decks, and a video camera. This army of newly empowered video producers will help return quality and integrity to video program content development.

One of the neat next steps that Light Source will take is to provide software that can read cues from the closed-captioning in broadcast signals. RadiusTV already displays the closed-captioning employed by some TV shows, so you have to imagine that Andrew Singer and his crew of engineers at Radius are thinking about this too. But Light Source has a jump on allowing the Mac to track words, or cues, based on the closed-caption information (say, for example, any news report including the words *Apple Computer*). Because the captioning is sent in advance of the signal, the software can be set up to capture frames of video directly onto a VCR based on a record sequence initiated when key phrases appear in the captions. But I digress into fantasies of finally having access to powerful technology, when in the end we return to . . .

Content Issues

That's right. We're talking Ted Turner and the MGM film library. We're talking Sony and Columbia Pictures. Once we've got the technology in our hands, the issue we face is where to get decent content, not just pretty pictures. Have you ever seen some idiot standing with a hand-held video camera taking pictures of everything that moves? Are you tired of watching

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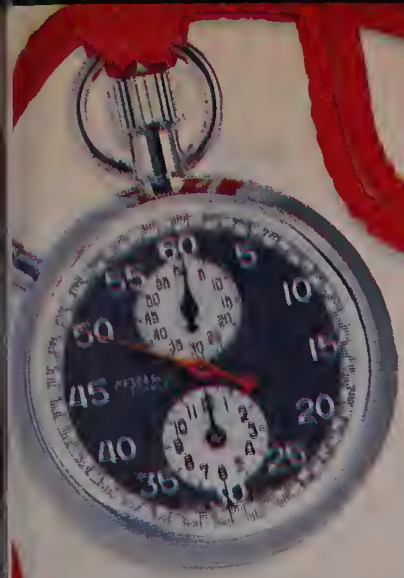

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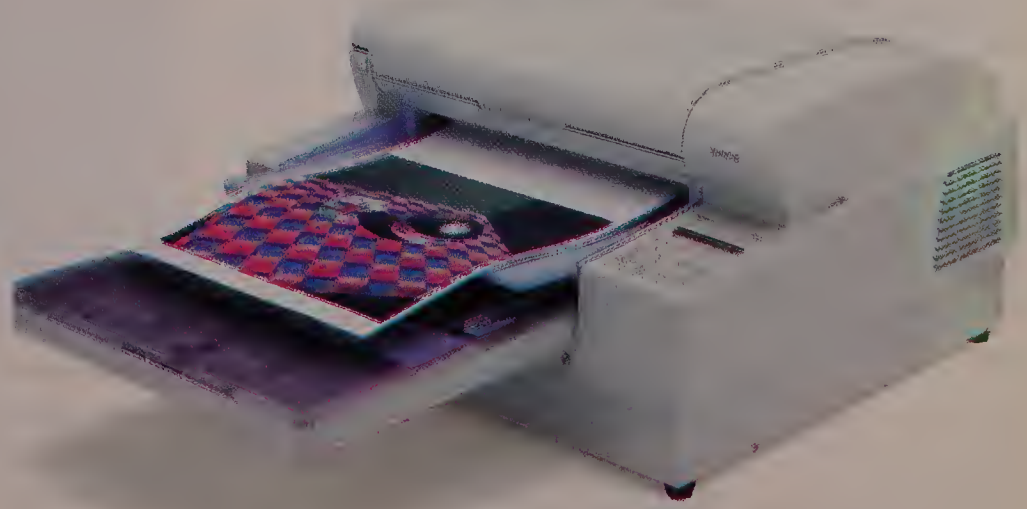

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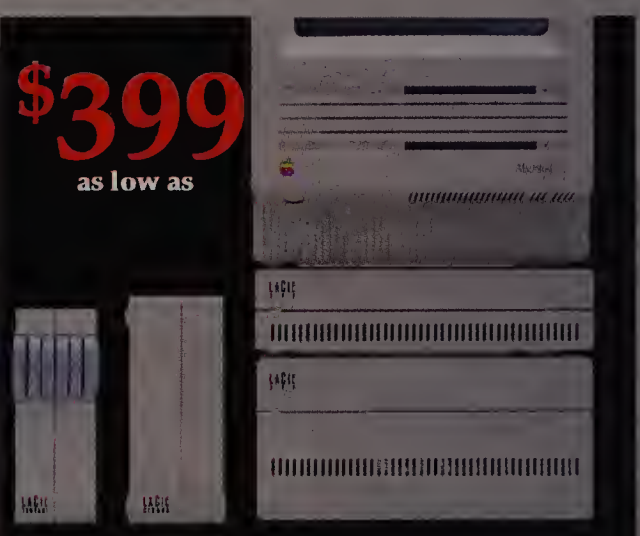

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"When I called La Cie, I was told someone would call me back. Would you believe after a few minutes, they called back?! Other calls I had made previously to La Cie were also returned promptly. The customer service and technical support people were patient and friendly." *Rick Monteverde, Honolulu, HI*

The experts agree. "Service star La Cie has up to a five year warranty, toll free support and guaranteed turnaround time for repairs. La Cie comes out on top in service and support." *Macworld, June 1990*

All names are trademarks or registered trademarks of their respective companies. Prices, specifications and terms are subject to change without notice. [1]On select drives only. [11]Call for details on Adobe Photoshop Limited Edition. U.S.A. only on bundles and shipping. La Cie, Ltd. 19552 SW 90th Court, Tualatin OR 97062. Phone (503)691-0771, Fax (503)692-8289. © Copyright 1990.

es it better!

Free Adobe Photoshop Limited Edition††, free Aldus PrePrint, free Silverlining and free Silverscan, equals a $1399 bonus with the purchase of Silverscanner at only $1999.

Silverscanner: 24 bit, up to 600 dpi, over 16 million beautiful colors, 256 smooth shades of gray and incredible line art all in a single pass.

Increased performance. "I love your Tsunami drive! It's fast, quiet, small and light and I can't emphasize how wonderful it is to turn the termination on and off. Of course, it doesn't hurt that you bundle Silverlining with it–the universal formatter with no competition that I know." *Johnathan Braun, Palo Alto, CA*

The experts agree. "La Cie offers the leading combination of software and performance." *Macworld, March 1990*

MacUser Labs show that La Cie drives are at the top of the pack in raw speed, best real-world performance, coolest temperature, quietest noise, and longest warranty (five years). *MacUser, February 1990*

More value and productivity. "My productivity has increased at least three-fold. My La Cie drive has performed beautifully. It is really fast, quiet and the documentation is very clear. When I had a question and called, I got a friendly, helpful person who really took the time to explain what I needed to know. This sounds like a testimonial. Yep, I guess it is. Thanks for giving such great value." *Craig Turner, Chapel Hill, NC*

"I create advertisements for movies. La Cie's Silverscanner has enabled us to sell a lot more jobs! Two thumbs up!" *Dave Works, Los Angeles, CA*

"I love these drives. The size is perfect, the response time is great, these are the best drives money can buy. I have searched and compared price, quality and performance with other products. La Cie is the best." *Edwin E. Rivera-Juan, Hato-rey, PR*

The experts agree. "If you are value conscious you'll be hard pressed to beat La Cie." *Macworld, November 1990*

"La Cie's longer warranties truly represent a good deal. The king of consumer choice." *Macworld Sept. 1990*

Since 1985 La Cie has offered you more benefits, quality, service and value than any other manufacturer. The experts and customers agree. *"I ♥ this drive." David Kennedy, B.C. Canada.* **Call to order.**

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LACIE LIMITED

You could have turned a $30,808.25 investment into $3,047,868.67 in 5.67 years with our Index Program.

The Saga Continues and Continues: 1990 profits = $527,256.88

Type	Purchase Date	Quant	Purch Price	Comm /Buy	Cost	Sell Date	Sell Price	Comm /Sell	Today's Value	P/L
Puts	12/28/84	100	$3 00	$209 25	$30,209 25	01/09/85	$4 25	$226 25	$42,273 75	$12,064.50
Calls	01/29/85	100	$4 38	$230 00	$43,980 00	02/11/85	$5 63	$267 50	$55,982.50	$12,002.50
Puts	03/12/85	100	$2 88	$209 25	$28,959 25	03/19/85	$4 00	$218 75	$39,781 25	$10,822.00
Calls	04/26/85	100	$3.50	$209 25	$35,209 25	05/20/85	$6 75	$301 25	$67,198 75	$31,989.50
Calls	06/26/85	100	$2 38	$209 25	$23,959 25	07/01/85	$3 13	$209 25	$31,040.75	$7,081.50
Calls	07/18/85	100	$5 00	$248 75	$50,248 75	07/23/85	$3 75	$211 25	$37,288.75	($12,960.00)
Puts	08/13/85	100	$3 25	$209 25	$32,709 25	08/26/85	$2 75	$209 25	$27,290 75	($5,418.50)
Puts	09/16/85	100	$2 25	$209 25	$22,709 25	09/26/85	$2 50	$209 25	$24,790 75	$2,081.50
Calls	11/05/85	100	$4 88	$245 00	$48,995 00	12/18/85	$19 63	$687 50	[illegible]	$146,567.50
Calls	01/27/86	100	$3 25	$209 25	$32,709 25	03/04/86	$10 88	[illegible]	$108,325 00	$75,615.75
Calls	03/12/86	100	$4 75	$241 25	$47,741 25	04/29/86	$9 63	[illegible]	$95,862 50	$48,121.25
Calls	05/21/86	100	$4 50	$233 75	$45,233.75	06/09/86	$9 75	[illegible]	$97,108.75	$51,875.00
Calls	08/06/86	100	$4 13	$222 50	$41,472.50	09/05/86	$12 75	[illegible]	$127,018 75	$85,546.25
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	$68,445 00	$23,211.25
Calls	11/25/86	100	$4 13	$222 50	$41,472.50	12/19/86	[illegible]	$245 00	$48,505.00	$7,032.50
Puts	01/02/87	100	$2 38	$209 25	$23,959 25	01/05/87	[illegible]	$209 25	$9,790 75	($14,168.50)
Calls	01/08/87	100	$6.75	$301 25	$67,801.25	[illegible]	[illegible]	[illegible]	$295,262.50	$227,461.25
Calls	03/05/87	100	$3.50	$209 25	$35,209 25	[illegible]	[illegible]	[illegible]	$29,165.75	($6,043.50)
Calls	03/20/87	100	$4 75	$241 25	$47,741.25	[illegible]	$8 25	[illegible]	$82,153.75	$34,412.50
Calls	05/06/87	100	$3.75	$211 25	$37,711.25	[illegible]	$2 25	[illegible]	$22,290.75	($15,420.50)
Puts	05/19/87	100	$4 88	$245 00	$48,995 00	[illegible]	[illegible]	[illegible]	$74,676.25	$25,681.25
Calls	06/17/87	100	$4 25	$226.25	[illegible]	07/16/87	[illegible]	$346 25	$82,153.75	$39,427.50
Calls	07/31/87	100	$3 13	$209 25	[illegible]	08/06/87	[illegible]	$248 75	$49,751 25	$18,292.00
Calls	08/10/87	100	$5 88	$275 00	[illegible]	08/26/87	[illegible]	$509 45	$136,390 55	$77,365.55
Puts	09/09/87	100	$4 38	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	$36,040 75	($7,939.25)
Puts	10/08/87	100	$7.75	[illegible]	[illegible]	[illegible]	$97.00	[illegible]	$967,242.50	$889,439.37
Puts	11/10/87	100	$5.00	[illegible]	[illegible]	[illegible]	$5 69	[illegible]	$56,605.63	$6,356.88
Calls	11/13/87	100	$3 50	$203 75	[illegible]	[illegible]	$2 38	[illegible]	$23,540 75	($11,663.00)
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Calls	02/11/88	100	[illegible]	[illegible]	[illegible]	03/17/88	[illegible]	$327 50	$75,922 50	$53,213.25
Puts	03/25/88	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	$267 50	$55,982 50	$22,023.25
Calls	05/16/88	[illegible]	[illegible]	$237.50	[illegible]	[illegible]	[illegible]	[illegible]	$52,243 75	$5,756.25
Calls	05/26/88	[illegible]	[illegible]	$226.25	[illegible]	[illegible]	$15.00	[illegible]	$149,451.25	$106,725.00
Calls	08/01/88	100	[illegible]	[illegible]	[illegible]	[illegible]	$2 63	[illegible]	$26,040 75	($14,178.00)
Puts	08/10/88	100	$4 00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	$73,430 00	$33,211.25
Puts	10/05/88	100	$3 25	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	$19,790 75	($12,918.50)
Calls	10/18/88	100	$5.50	$263 75	[illegible]	10/21/88	[illegible]	[illegible]	$94,616 25	$39,352.50
Calls	01/09/89	100	$7 13	$312 50	[illegible]	02/09/89	[illegible]	$638 75	$179,361 25	$107,798.75
Calls	02/17/89	100	$6 25	$286.25	[illegible]	[illegible]	[illegible]	$256.25	$52,243 75	($10,542.50)
Puts	02/23/89	100	$3 75	$211 25	[illegible]	[illegible]	[illegible]	$245.00	$48,505.00	$10,793.75
Calls	03/06/89	100	$5 63	$267.50	[illegible]	[illegible]	[illegible]	$350 00	$83,400.00	$26,882.50
Calls	03/29/89	100	$6 38	$290.00	[illegible]	[illegible]	[illegible]	$421.25	$107,078.75	$43,038.75
Puts	05/10/89	100	$2 63	$209 25	[illegible]	[illegible]	$1.75	$209 25	$17,290.75	($9,168.50)
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Calls	08/24/89	100	$3 63	$209 25	[illegible]	08/25/89	$8.13	$342 50	$80,907 50	$44,448.25
Calls	09/28/89	100	$4 13	$222.50	[illegible]	10/09/89	$11.25	$436.25	$112,063.75	$70,591.25
Calls	12/29/89	100	$4 13	$222.50	[illegible]	01/03/90	$8.25	$346 25	$82,153.75	$40,681.25
Puts	01/09/90	100	$5 50	$263.75	$55,263 75	01/15/90	$13.00	$488.75	$129,511.25	$74,247.50
Puts	01/16/90	100	$8 75	$361.25	$87,861 25	01/24/90	$14.88	$545.00	$148,205.00	$60,343.75
Puts	02/21/90	100	$4 25	$226.25	$42,726.25	02/26/90	$2.94	$186 88	$29,188.13	($13,538.13)
Calls	03/16/90	100	$6 63	$297.50	$66,547 50	03/20/90	$10 00	$398.75	$99,601 25	$33,053.75
Calls	04/12/90	100	$5 50	$263.75	$55,263 75	04/16/90	$8.25	$346 25	$82,153.75	$26,890.00
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Calls	05/08/90	100	$4.75	$241.25	$47,741.25	05/14/90	$19.25	$676.25	$191,823.75	$144,082.50
Calls	06/22/90	100	$6 63	$297.50	$66,547.50	06/25/90	$3.63	$207.50	$36,042.50	($30,505.00)
Puts	08/07/90	100	$7 88	$335 00	$79,085.00	08/24/90	$22.25	$766.25	$221,733.75	$142,648.75
										$3,047,860.67

76.79% Accurate: Above is a chart of OEX trades from December 28, 1984 to August 24, 1990, based on the signals generated by the ***Right Time-Index Program™***. *By following the signals generated by the program, the rules in the manual and starting with just a small amount of capital ($30,209.25) your profits would have been over $3,000,000.00.*

The Right Time™ computerized trading system was developed by an expert portfolio manager for his own personal use. Over the last ten years of in-market use the software has been perfected and made easy to use. Now it's available for any smart trader who wants to make quick profits from quick decisions. Just look at the profits generated in the above chart!

Not only is **The Right Time™** the best decision support system ever devised for traders, it's the only software that analyzes volume/price, support/demand, and global market trends – all at the same time.

Amazingly Precise.

The Right Time™ programs run on IBM (and compatible), Apple II and Macintosh personal computers. The software is easy to use, amazingly precise, and very, very clear in its signals.

You can retrieve and update signals for your stocks, commodities, indices or funds from Dow Jones, Warner, Signal, DBC or the Radio Exchange in less than five minutes per day. What's more, you can play "What If" games and have results in about one second.

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- Futures Program: *"Very profitable with four out of five winners. Paid for itself the first trade."* B.L., investment advisor.
- Mutual Funds Program: *"Accurately picked my last seven profitable trades. I couldn't trade without it."* L.S., individual investor.
- Day Trading Program/Index, Futures or Stock: *"The Day Trading Programs are sensational."* P.S., investor.

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Call **(800) 755-8277** or write for our free twenty page brochure or to place your order. Each of our end-of-day programs costs **$599**, any two **$999**, any three **$1399**, any four **$1699**, any five **$1999** or all six for just **$2399**.

Demonstration programs are available for **$59** (each) Each demo includes our complete manual.

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Future results may vary

All programs not available for all computers

Circle 33 on reader service card.

mindless marketing presentations done in PowerPoint? Companies are scrambling to gain control over existing content for the new media because originating new materials is difficult, expensive, and requires talent—not marketing clout.

There is some good news. Many films made before 1963 have run out of copyright protection, and with each passing year the library of films in the public domain will become richer because many less commercially viable films will have had their copyright lapse. However, the content in existing film and music libraries will primarily serve the entertainment industry. And public-domain materials will serve specialist markets such as educational applications, not the new media.

So Where Will Content Come From?

The better publishers of the new media will develop staff experienced with video and with capturing video. Staff that will bring skills as content editors from disparate fields, and combine those sets of skills with desktop technology to create video as rich as any organization can produce.

Certainly we'll have the equivalent of what happened with the first waves of desktop publishing—more newsletter-quality material than you can shovel into a toxic waste dump—but it will get better fast. By 1992 we'll use these skills, and new software tools, to evolve the new media. Media in which video, type, data, images, and sound will combine in ways that we're only beginning to envision.

Certainly some of the new media will come from televangelists and car-wax salesmen turned into self-made millionaires preaching about management techniques or how to improve one's personality. Hey, these people are why God created remote-control devices.

The changes that I'm describing offer the hope that each of you reading this will begin to produce little books, plays, travelogues, family remembrances, pamphlets on how to fix kitchen sinks or repair your old house; the equivalent of magazines that you will view and share with your friends. And together we'll create the new media. ■

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with 11.9 milliseconds seek time
and 3.0 megabytes-per-second transfer rate.

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The Best Macintosh Training Solution For SmallerTraining Budgets

60% of all new software purchased is abandoned within 3 weeks according to a recent survey in *PC Magazine*. Statistics show that hundreds of thousands of dollars are wasted by companies and by individuals who purchase software programs that are never used.

The survey only mentioned programs that have been put away on the shelf. It didn't add in the staggering number of computer users who use *only ten to fifteen percent of their program's capabilities*.

Think of the price of today's Macintosh software. It isn't cheap! Is this money wasted? Only if your Macintosh is half used, if your programs have been stuck on the shelf, or if your Macintosh users are not 100% trained on the computer and each business program.

An Expensive Irony.

Right now thousands of individuals and companies are considering buying faster, more powerful, and more expensive computers. They are also spending thousands more on software upgrades and new software purchases.

Ironically, few are budgeting equal amounts of money for training. The simple truth is that *training* is the least expensive investment you can make. New equipment can increase productivity by micro-seconds. *Training* can increase productivity by days and weeks.

Training Options.

MacAcademy was the first company to nationally offer both live workshops and video training. MacAcademy has specialized in Macintosh training for the past four years and has trained over 50,000 Macintosh users. VIDEO TRAINING is an ideal training solution for companies facing ever-smaller training budgets. Video training is effective, fast, and the least expensive training option available.

Why Video Training?

Speed Learning: The Macintosh is a graphics based machine. It thinks and operates through the use of pictures. Unlike the IBM which is character and keyboard based, the Macintosh is a visual machine. *The emphasis is the screen.* The best way to learn the Macintosh is by *seeing* each technique taught on the actual Macintosh screen. A MacAcademy Video shows you step-by-step each Macintosh technique. Each software technique is clearly and visually taught to the new user.

Flexibility.

Videos can be used by individuals or shown to entire companies. Videos can be checked out and taken home by new employees. Videos can be fast forwarded and rewound to review key techniques. Videos are easy. Studies have shown that many Macintosh users are lazy. Training programs that take a great deal of individual time and effort end up sitting right next to the abandoned software. People already are used to watching videos. MacAcademy videos are usually watched within the first two days!

Quality.

There are other video training programs out there. Most of them are only 45 minutes to an hour in length. Nearly all MacAcademy training videos run a full two hours. Each trainer featured on MacAcademy videos is our highest rated instructor for that program from the two-day live MacAcademy workshops featured in over 100 cities throughout the U.S. Our instructors are not actors or software sales people. They are business executives who have been chosen from hundreds of applicants due to their excellent teaching skills, their thorough knowledge of the program, plus their hands-on business background using the featured program. MacAcademy instructors are unmatched in the industry.

Selection.

MacAcademy now offers over 45 different Macintosh training videos (see next page for complete selection). In most cases we offer video training for beginners, for intermediates, and for the more advanced user.

Price.

Each video is only $49. If you pay hundreds of dollars for the program and thousands of dollars for the computer, doesn't it make sense to invest $49 to make that original investment even more valuable?

Guarantee.

MacAcademy is the most trusted name in Macintosh training. Over 10,000 companies currently rely on MacAcademy video training. We invite you to invest in the most effective and valuable Macintosh training available. If, for any reason, for a full 30 days after receiving your Video Training Tapes, you are not totally satisfied, simply return the tapes for a full refund.

To Order.

Please read the next page which lists all tapes now available and includes complete ordering information. Thank you for your business.

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MacAcademy Introduces 43 Macintosh Video Training Tapes

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Advanced Mac ____	FileMaker Pro (Part 3) ____	Word 4.0 (Part 1) ____	QuarkXPress (Part 3) ____
Adobe Illus.(Part 1) ____	FileMaker II (Part 1) ____	Word 4.0 (Part 2) ____	Quicken ____
Adobe Illus.(Part 2) ____	FileMaker II (Part 2) ____	Works (Integration) ____	Canvas (Part 1) ____
Dollars & Sense ____	PageMaker 4.0 (Part 1) ____	Works (W. Process.) ____	Canvas (Part 2) ____
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SuperPaint (Part 2) ____	PageMaker 4.0 (Part 3) ____	Works (Spreadsheet) ____	Utilities, CDEV, INIT ____
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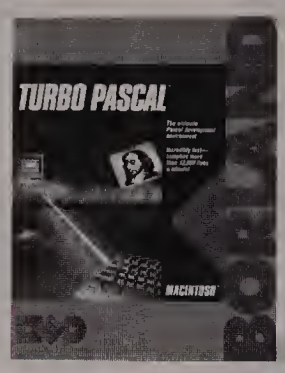

	THINK PASCAL	TURBO PASCAL
MultiFinder Compatible	YES	NO
Latest Apple Software Support	YES	NO
Latest Apple Hardware Support	YES	NO
Instantaneous Linking	YES	NO
Source-Level Debugging	YES	NO
Pretty-Printing Text Editor	YES	NO
Object Pascal Support	YES	NO
Class Library Included	YES	NO
Class Browser	YES	NO
On-Line Tutorial Available	YES	NO
Automatic MAKE facility	YES	NO
Apple's MPW Source Compatible	YES	NO
Supports 68881/68882 FPU	YES	NO
Committed To System 7.0	YES	NO

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LETTERS

WARD SCHUMAKER

Plain Brown Wrapper

My wife instantly picked up on the masculo-erotic theme of the cover design on your November issue ["Huge Hard Disks"]. Just what are you guys up to? Don't you know your magazine is sold on family newsstands?

I am reading the articles in this issue backward to look for satanic invocations.

John A. Wood
Cambridge, Massachusetts

Gee, and we thought we were talking about disk drives.—Ed.

Blame It on the Mac

I have to agree with Steven Levy [*Iconoclast,* November 1990] that my experiences with the Mac have been positive, but I don't attribute any writing success to it nor do I have any right to blame it for any shortcomings my writing may have. Yes, in our technological world it may seem as if computers can make things easier; but we can't let this make us think we can get by with shoddy work.

Jay J. Jacobs
Western Springs, Illinois

Mightier than the Pen?

I won't attempt to suggest Marcia Peoples Halio is wrong about the students in her classes [*Iconoclast,* November 1990]. But her conclusion that the Mac is somehow at fault leads me to suggest two brief items of anecdotal evidence that show her theories to be filled with holes.

The day I brought home my first Mac, I wrote the initial words of what was to become my first published novel. I was so thrilled with seeing my words on the Mac's screen that I wrote with the clarity and vision of one newly sighted. Gabriel García Marquez gave up his treasured ink pen and paper for a Mac, and the world of literature doesn't seem to have suffered from the conversion.

May you live with MS DOS forever, Ms. Halio. That would be compensation enough for Macintosh lovers everywhere.

Richard Lees
Studio City, California

Closer Look

Does the Mac make you stupid? Perhaps, but I don't know. Yet the subline for Steven Levy's column in your November issue makes it appear that I do.

Although I think Levy did a fine job of summarizing the main points of my January 1990 article in *Academic Computing,* "Student Writing: Can the Machine Maim the Message," as well as the arguments raised by some of the critics of my work, I do object to the wording you printed.

I have never said, nor will I ever say, that the Macintosh, or any other machine, makes anyone stupid. What I have said, and will continue to say for the foreseeable future, is that students writing on the Mac (Graphical User Interface) have produced very different essays both in form and content in classes in the freshman English program at the University of Delaware than those using IBM PCs (Command Language Interface).

In the meantime, in the midst of a very considerable amount of heat and pre-

(continues)

Corrections

The Understanding Business created the 1990 U.S. atlas shown on page 174 of the October 1990 issue ("Prepress Progress Report").

The line "All three of the new Macintoshes use 8MHz Motorola 68000 coprocessors" ("Mac Classic," December 1990) should have read "all three of the compact Macs." The error resulted from a change made during the production process.

*The telephone number for CJS Systems (*Conspicuous Consumer, *November 1990) is 415/849-3730.*

*Fractal Clip Art from Koyn Software (*New Products, *November 1990) retails for $37.95.*

PSI Integration is the maker of the SE/30 Bus Adaptor Card with Cache/FPU Option and the Com-

(continues)

The 1990 index to *Macworld* articles is available by mail. To receive a copy, send a self-addressed, legal-size envelope with 50 cents postage to Index, *Macworld,* 501 Second St., San Francisco, CA 94107. The 1990 index is also available in the Macworld forum on America Online.

HIT THE R

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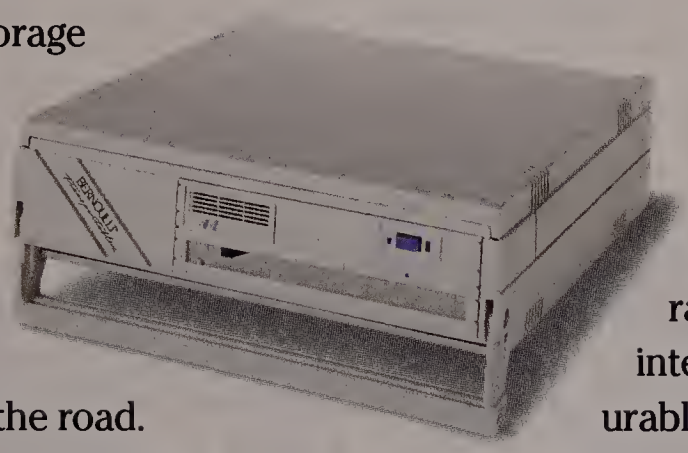

In a shakedown of removable storage devices, one drive quickly rises to the top. The new 44MB Bernoulli® Transportable. A revolutionary drive that delivers truly reliable hard-disk-like performance. Day in and day out. Whether in the office or on the road.

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Media Reliability		
Media Warranty	*5 yrs.*	*2 yrs.*
Drop Height	*8 ft.*	*2.5 ft.*
Non-operating Shock	*1,000Gs*	*100Gs*
Performance		
Effective Access Time	*22 msec.*	*20 msec.*
Transfer Rate	*8-12 Mbits/sec.*	*4.8 Mbits/sec.*
Large File Dup. (3)	*27 sec.*	*34 sec.*
Small File Dup. (many)	*82 sec.*	*174 sec.*
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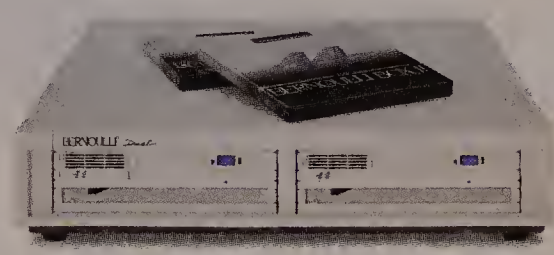

Which all adds up to one thing: Bernoulli's closest competition isn't close at all.

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*plete Fax/Modem (*MacBulletin, *December 1990).*

*The correct phone number for Superior Process Engineering, maker of HyperSnoop (*New Products, *December 1990), is 619/762-5843 or 800/350-8219.*

*The 3MB Static RAM Board from Lifetime Memory Products (*New Products, *December 1990) retails for $1095.*

*CompuServe Information Manager can be ordered by typing GO ORDER on CompuServe or by calling CompuServe's telephone sales and inquiry department at 614/457-0802 or 800/848-8199. The cost to CompuServe members is $24.95; $39.95 for nonmembers (*Reviews, *December 1990).*

cious little light, some of my colleagues and I are continuing to look in some detail at student writing produced on Macs and IBMs, and we are seeing some very interesting differences. I think our work is important, but it doesn't help us to proceed as serious researchers if publications like *Macworld* take advantage of the emotional nature of this debate by printing inflammatory headlines on articles.

If readers took the trouble to go beyond the headlines and actually examine Levy's piece, they would find some interesting issues. But judging from the recent attacks, many people didn't.

Please help me take the debate out of the right brain and put it into the left!

Marcia Peoples Halio
Newark, Delaware

Dealing with Duds

Regarding the September 1990 *Commentary* on switching to mail order, is it possible that authorized Mac dealers are actually some sort of money-laundering front for the underworld? Most of the salespeople I've encountered are so unknowledgeable that I leave the stores wondering why no one who knows the machines and applications has opened up shop in our area.

At one dealership, I ended up having to demo the graphics-placement capabilities of PageMaker 3.0 for another customer because the salesman could not figure it out. Then he tried to sell the customer the program for $595—no doubt because of the excellent support. My experience is that you can always get better software support from the mail-order outfits than you can from local dealers.

Andrew Loree
via AppleLink

Get Thee to a User Group

I am a longtime reader of your magazine and I liked David Pogue's article *Life Online* (September 1990). It did, however, leave some gaps for those who, like me, enjoy using networks like CompuServe but don't like the $250 price, and hate using networks like Prodigy but love the $9.95 price.

For users who like using networks but can't afford to, the answer seems simple: join a local user group. The trouble is finding one. A lot of readers, myself included, would like to see an article

(continues)

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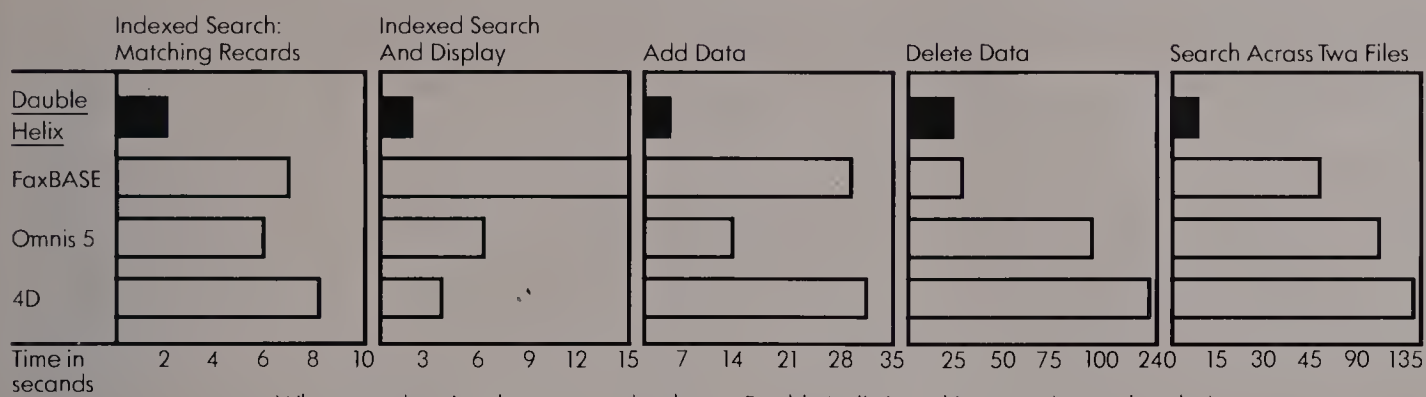
Circle 221 on reader service card

Since we know you're pressed for time, we'll skip the standard introduction and get straight to the point.

■ Double Helix is the fastest multiuser relational database for the Macintosh. This, you should know, is not our personal assessment, but rather the conclusive results of MacUser magazine's June 1990 speed-test. And of the four top databases, in five key commands, Double Helix finished first. By considerable margins.



When speed-testing the top Mac databases, Double Helix in multiuser made wan hands down.

IMMEDIATE GRATIFICATION, RIGHT FROM THE START.

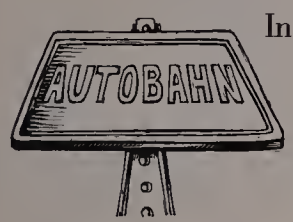
■ Here is—and we quote—what MacWorld said in May 1990: "If you need a working database by Friday morning, and it's now Wednesday afternoon...your best bet is Double Helix." Talk about fast. With Double Helix in hand and no prior knowledge at all, you can, in a matter of hours, mold Double Helix to conform to your individual needs. And as your needs change, so can, with minimal effort, your applications.

Not just built for speed: "Double Helix is the most user-friendly database currently available." MacUser, June 1990

IF YOU'RE IN A HURRY, READ THIS AD.

WELCOME TO THE WORLD'S VERY FIRST MAC-BASED CLIENT/ SERVER DATABASE.

■ What makes Double Helix so fast? Technically, it's because of our advanced client/server format. Unlike fileservers, which slow your system down by shuffling copies around the network, client/server lets all users work directly off a master. This keeps network traffic down. And productivity up.



Client/server keeps everyone moving fast.

In addition to speed, client/server provides another crucial benefit: total referential integrity. In other words, when one user makes a change to the master, the whole network gets updated—in real-time. On your screen. Right then and there. So everyone has the same data. And everyone's in sync. The end result: a group that's always working in one direction—forward.

■ By the way, and for the record, we were the first ever to introduce a Mac-based client/server. And while it was revolutionary at its debut in 1986, it is, remarkably enough, still revolutionary today.

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■ We've just spent the last 456 words talking about how fast and affordable Double Helix is. Now you can spend the next 14 numbers confirming it all for yourself. Call 1-800-323-5423, ext. 234 and we'll send you out a test flight demo and Quick Start instruction guide of your choice right away. After all, if you stayed with us this long, you've got no time to waste.

Double Helix

ODESTA CORPORATION

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on how to locate local user groups, or have the address of a place that can provide that information.
Tom Harty
Minnetonka, Minnesota

We usually run Apple's user-group hotline number in appropriate articles. Call 800/538-9696, ext. 500, to locate groups in your area. Canadians only can call Apple's User Group Connection at 408/974-4060 for the same information.—Ed.

Three Mechanical Mice

Jim Heid's November article "Getting Started with Input Devices" implies that the mice used with today's Macs are the type that sense ball movement through the rotation of an electronic optical sensor. This is not true. Apple's older mice were of the optical design. The newest mechanical mouse is distinguishable by its heavy gray rubber ball. The optically operated mouse described in the article's figure has a lighter-weight black rubber ball.

The new mouse with the gray rubber ball was designed to be less expensive; unfortunately it is also of lesser quality. The noncontacting optical mechanism in the old mouse has been replaced by open rotary mechanical contacts that operate directly off the capstans. The new, gray-ball mouse exposes the ball to the interior of the mouse body, allowing any accumulated crud to eventually make its way into the open contacts. Anyone could have predicted that this would result in the jumpy, intermittent mouse operation that makes you want to pull your hair out.
A. Farrel Droke
Norman, Oklahoma

Apple currently ships three mice, and only fate determines which one you'll get. One species is electromechanical, using the ball to drive two wheels with metallic encoders ringing their edges. A current is made and broken as the encoders spin past electrical contacts. The other two mice use the optomechanical design described in Jim Heid's column.

Paul Prebin, product manager for Apple's input devices, describes how to tell the three rodents apart: The electromechanical mouse has a heavy gray ball with a sliding retainer ring and is made in the United States. The first optomechanical mouse has a lighter-weight black ball with a rotating retainer and is made in Taiwan. The second and latest optomechanical mouse (shipping since last summer) has a heavy gray ball with a rotating retainer and hails from Malaysia. As to the durability of the electromechanical mouse, Prebin says, "The electromechanical mouse meets the same stringent Apple quality specs as the other mice, and it should last for many, many years."—Ed.

Adding It Up

I was most surprised to read your article about laser printers and find that you panned the HP LaserJet IIP ["Page Printers Revisited," October 1990]. I have recently purchased one and find it an excellent choice for my printing needs. Yes, it is a little slow. But it does everything I need it to do.

Most amazing of all is your report of the $3455

(continues)

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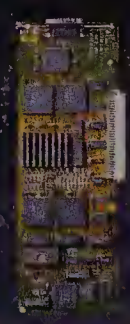

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Circle 231 on reader service card

price tag for a useful setup. Let me itemize my costs: One HP LaserJet IIP (with 1MB memory board), $1500; one GDT Software Jet Link Express printer driver, $150; one 250-sheet lower cassette at no extra cost; for a grand total of $1650 in Canadian funds, which includes all duties and taxes. How can you say that is expensive?
M. Dale Lauber
New Westminster,
British Columbia, Canada

Our figures still add up when you calculate the retail cost of making the printer truly Macintosh-compatible—that is, equipped with PostScript and a LocalTalk interface: $1495 for the printer, $275 for the AppleTalk interface, $695 for the PostScript cartridge, and $990 for the 2MB memory board. The HP LaserJet IIP you describe lacks PostScript and can't be shared on a network; plus there's always the chance that incompatibilities will surface when you're using a third-party printer driver. What you have sounds like a good second-best solution, to be sure. By the way, sounds like you got a good deal on the no-cost 250-sheet printer tray; it retails for $195.—Ed.

Test Drive(s)

Why didn't you test more of the drives offered by your own mail-order advertisers in the article, "Huge Hard Disks" [November 1990]?

One drive that particularly stands out in the advertisements is the Imprimis 330MB Wren Runner, which would appear to be the fastest of all drives, at 10.7 milliseconds seek time. The shortest seek time listed in your article is 12.0 ms.

In fact, of the top ten drives listed, only one has a retail price of under $3000.
Orville E. Beau
Wayland, Massachusetts

We try to include products from all vendors, but inevitably we miss some. Some vendors did not make big hard drives when we requested review units last April; a few did not respond to our requests. Nevertheless, we tested mechanisms from all the manufacturers you cite—and more. Five of the drives we tested—the Deltaic Systems Server 300Q, the FWB hammer300, the MicroNet SB330, the Procom MD 320, and the Storage Dimensions MacinStor 325—use the Imprimis Wren Runner (Imprimis is now part of Seagate). The seek times we published are not the manufacturers' claims often quoted in ads, but results from Macworld Lab's own tests.

Price is important when selecting any product, but it shouldn't be your only concern; consider as well reliability, service, support, and bundled software. Also, be sure to compare your dealer's discounted prices (not the vendors' list prices) with mail-order prices. Of the 21 vendors whose drives we tested, 10 sell directly to consumers: Deltaic Systems, Ehman, GCC, Hard Drives International, La Cie, Liberty, MacProducts, Microtech, Mirror, and Ruby.—Ed.

Drive Debacle

I had to laugh at the Service Hero box appearing in the *Conspicuous Consumer* column of the October *Macworld*.

I agree with Michael Scoville that Direct Peripherals Inc. displays admirable customer service. What I

(continues)

The UnMouse®

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BERKELEY SYSTEMS
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think he hasn't yet realized is that the company developed this talent through lots of practice.

A while back, we purchased four DPI 20 external disk drives for various Macintoshes in our facility. At least three of them had to be sent back to DPI for exchange within their first few months of use. And several of those replacement disks also gave up the ghost and had to be exchanged repeatedly.

During this disk-juggling act, we came up with 20MB disks labeled as 30MB, and vice versa. All of the drives we received have their model/serial number tags on 1-inch-by-3-inch mailing labels, some typed and some handwritten!

Robert J. Koskovich
Downey, California

Paper or Plastic?

I have just received my October issue of your fine magazine, and as usual, I enjoy reading it. I am deeply disturbed, however, that you still ship *Macworld* in a plastic wrapper.

In the interests of a better world, please cease this unconscionable practice. This issue is important enough to me that I will base my renewal decision upon it.

Michael Barrow
Pownal, Vermont

We're willing to bet the October issue is the only one you received in a plastic wrap. We stopped poly-bagging the magazine close to two years ago. Ironically, the only issues we wrap are those that contain renewal notices. —Ed.

Debugged

I must take issue with the statement in your QuarkXPress 3.0 review (*Reviews*, November 1990) that claims the program is buggy. As a QuarkXPress user since 1988, I find 3.0 to be the least-buggy version yet; in fact, I have gotten only one system error in the two and a half months that I have been using it, as opposed to at least three a week with earlier versions. Quark has also sent all 3.0 users a "zapper" disk to correct all known problems with the first release of 3.0. Sure, QuarkXPress is slow on lower-end machines, but then you don't send a child to do an adult's work. Why should desktop publishing be different?

Lucas Feininger
Arlington, Massachusetts

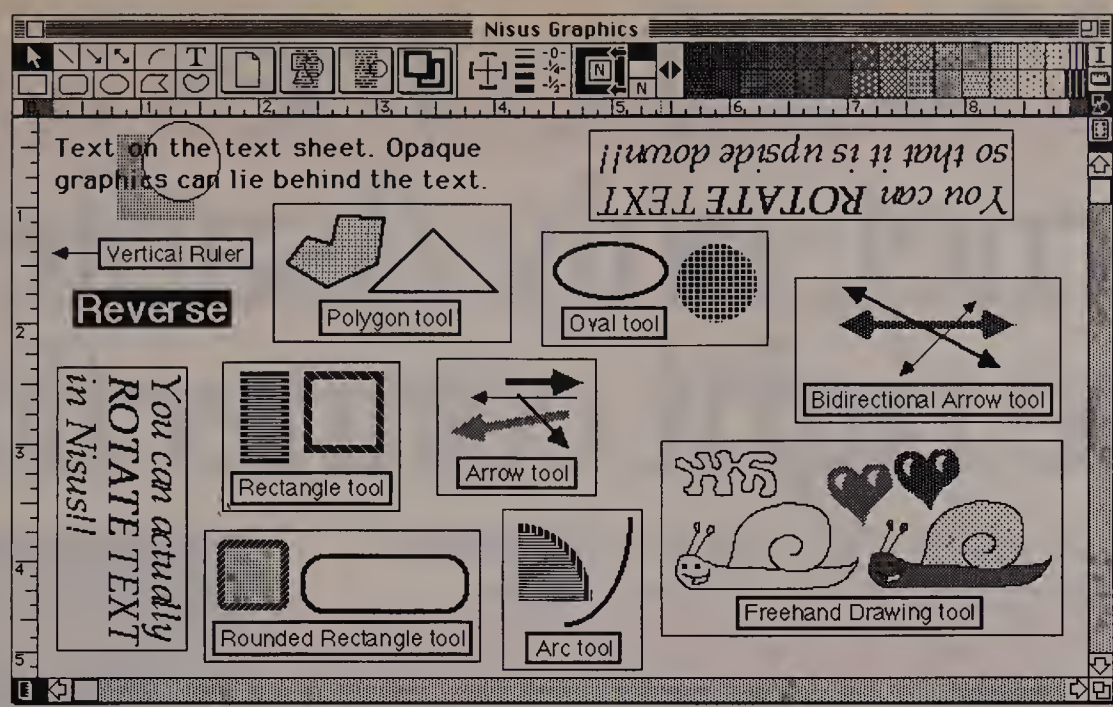
Still Bugged

Seems as though Quark has done it once again. QuarkXPress 3.0 is a disaster, and judging from busy signals and turnaround time, the calls for technical support are coming in more waves than the Iraqis have tanks.

Adding pages to a document causes the system to hang, with the only way out being to reboot. When adding pages or text or when inserting stuff, text does not properly reflow through the document. Occasionally the Save command goes off to never-never land, leaving the watch to spin, but look, Ma, no disk activity.

Dennis Erskine
via AppleLink

Letters should be mailed to *Letters, Macworld,* 501 Second St., San Francisco, CA 94107, or sent electronically to CompuServe (70370, 702) or MCI Mail (294-8078). Include a return address. We regret that, due to the high volume of mail received, we're unable to respond personally to each letter. We reserve the right to edit all letters. All published letters become the property of *Macworld.*



If a picture is worth a thousand words, then why not use a word processor that processes pictures too?

Nisus® lets you communicate the way the Macintosh works—with words and graphics

Most people aren't really interested in whether a program is a word processor, a graphics program, or a page layout program. All they really want to do is communicate.

Sometimes, something as simple as a note with an arrow attached is all you need to make your point.

Other times, a little grey background behind some text seems more appropriate. The tools you need to communicate come built into Nisus, or you can place a PICT graphic like the features list on the right.

Nisus lets you draw attention to electronic symbols or scientific notation. Text wraps around your callout box automatically.

CIRCUIT DIAGRAMS IN A NISUS® DOCUMENT

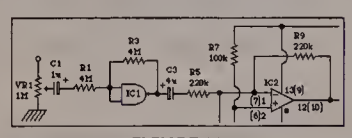


FIGURE 1A

This is a Laser TechFonts[1] diagram. As you can see, you can put a complicated diagram directly into your document. In this case, the diagram was drawn using specialized "draw" circuit fonts, along with the Scientific text fonts. These special fonts allow you to design a schematic quickly, using a draw or paint program, or a word processor with integrated graphics, such as Nisus®, the amazing word processor from Paragon Concepts, Inc.

SCIENTIFIC EQUATIONS WITHIN A NISUS® DOCUMENT

This is a section of Laser TechFonts[1] within a Nisus document: $\frac{3(x-3)^2}{2}(x^2-x)^3$. The first part of the equation, $\frac{3(x-3)^2}{2}$, is an example of the Fraction font, which allows a fraction to be typed on one line of text. The exponent 2 in the numerator is Fraction superscripted. The second part of the equation, $(x^2-x)^3$, is an example of the Scientific font, with the exponents 2 and 3 in the SuperScientific font.

You can type equations into Nisus using Laser TechFonts, and then put boxes around them. These boxes, drawn using the Nisus graphics palette, call attention to examples and formulas. This feature is perfect for writing manuscripts, exams and study guides.

$$\beta = \frac{\sigma_{xy}}{\sigma_x^2} = \frac{\sum_{i=1}^{n} X_i Y_i - \frac{1}{k}\left(\sum_{i=1}^{n} X_i\right)\left(\sum_{i=1}^{n} Y_i\right)}{\sum_{i=1}^{n} X_i Y_i - \frac{1}{k}\left(\sum_{i=1}^{n} X_i\right)}$$

FIGURE 1

You can "Place" any page of a Nisus file containing text and graphics into another Nisus file where it becomes a picture called a "Placed Page Graphic." Double clicking this "Placed Page Graphic" will open the original file for editing. Graphics can be drawn or pasted to three different layers: the text layer, behind the text, and in front of the text, giving you total control.

Nisus lets you rotate text, which is very important if you are designing a self-mailer that folds into three panels. Nisus also enables you to print two pages up—pamphlet style. So, for example, suppose you want to print two pages on a single 8 $\frac{1}{2}$ by 11-inch sheet of paper turned sideways. You can do it with Nisus by a simple selection. Perhaps more important, however, is that this same command will collate your pages—in an 8 page document, for example, page 1 and page 8 will lie next to each other!

If you're new to the Macintosh word processing market, you probably want a word processor that is easy to use. If you've been around for a while, you undoubtedly want a powerful word processor. Chances are you have tried either MacWrite or Microsoft Word. 4.0. One is easy to use, the other offers power. Both, however, have severe limitations which is why we developed Nisus in the first place.

Nisus has a built-in word processing language which does for word processing what built-in languages do for databases. For example, the language allows you to develop routines to index all proper names, a method to find and correct all double words, periods, and extra spaces, or index every word in a document except those you specifically want to exclude. You choose the features.

Discover why Nisus is shipped with every Macintosh in Korea, why *MacUser U.K.* named Nisus "1989 Best Word Processor," and why *Macworld Australia* uses Nisus as its word processor of choice.

This two column format above is actually a separate Nisus file placed into the master file. This gives you total control over how you layout a Nisus document.

Nisus Feature Comparisons	NISUS 3.0	Word 4.0	WriteNow	MacWrite II
Built-in word processing language (GREP & macros)	■			
Noncontiguous text selection	■			
Unlimited column formats	■			
Find and replace or index	■			
Find any font, *style*, size, or color	■			▩
Place text or graphic linked to parent text or graphic file	■			
Find and replace in unopened files	■			
Cross reference text	■			
125,000+ user definable key commands	■			
"Super Style sheets"	■			
Automatic File Comparison	■			
10 editable clipboards	■			
Mark text as electronic book mark	■			
Built-in Graphics	■			
Rotate text and graphics	■			
Unlimited undos back to "open file"	■		▩	
Reads and Writes Microsoft Word Files	■	■	■	■
Vertical Ruler	■			

▩ Limited implementation

Free Brochure

Call today for your free complete brochure describing Nisus in detail. And while you're at it, ask yourself how many more words this ad—created in Nisus—would have taken without the pictures.

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Extension 800

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Solana Beach, CA 92075
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Circle 253 on reader service card

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If you haven't yet heard of the new 10BaseT Ethernet™ technology, you've come to the right place. Because there is no better place to learn about the latest in technological advances than from the leader in Macintosh® networking. Asanté Technologies.

The Ins And Outs Of 10BaseT.

10BaseT was recently adopted by the IEEE as a new standard for running high speed Ethernet over unshielded twisted-pair telephone wire. It can often be installed right over your existing telephone lines, keeping installation costs well below both thick and thin Ethernet, yet operating at the same 10Mb per second speed.

With a 10BaseT network, you can link all your Macs, PCs and any other workstations with a 10BaseT card to a central hub in a star configuration. It's easy to add or remove nodes, and isolate problems. If one computer goes down, the others stay up and running.

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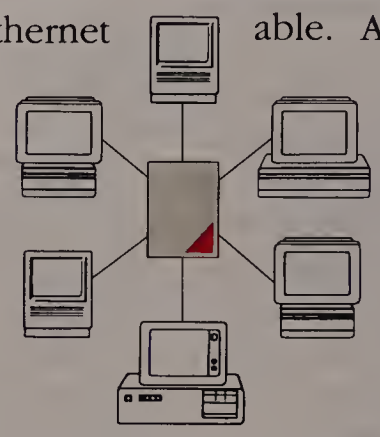
10BaseT technology can turn your telephone lines into a high speed, easy-to-maintain Ethernet network.

The Best Of 10BaseT, From Asanté.

As the leader in Macintosh technology, you can count on Asanté™ to have the fullest line of 10BaseT products available. Only Asanté offers interface cards for the Macintosh SE, SE/30 and Mac II family of computers to keep you well connected in a variety of ways.

The Asanté 10T Hub™ is built for maximum flexibility. Shipped with interchangeable back panels, you can connect up to 12 Macs using either RJ-45 jacks or a 50-pin connector that plugs directly into your telephone system. It has ports for both thick and thin Ethernet cabling. And a series of LEDs to help you determine link status, auto-partitioning, network traffic and transmission jams, as well as achieve peace of mind.

And with the Asanté 10T MAU™ transceiver, you can plug your PCs or other computers with thick Ethernet cards into your 10BaseT Macintosh network, and answer all of your needs.



Our 10T Hub connects your Macs in a star configuration for ultimate reliability.

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We Keep Our Reputation By Keeping Ahead Of The Times.

Asanté earned its reputation as the leader in Macintosh networking by creating the fastest, most reliable Ethernet cards available. As new Macs are introduced, Asanté will keep that reputation with the highest performance, lowest cost networking solutions.

Asanté is dedicated to offering the best in Macintosh networking technology. And committed to providing you with all the right connections. All the time.

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Asanté Technologies, 405 Tasman Dr., Sunnyvale, CA 94089, 800-662-9686.

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Circle 56 on reader service card

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BMPL 15-226 10-046 06-746 12-046

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☐ RENTING ☐ OWN ☐ BUYING — MONTHLY PAYMENTS $	HOME PHONE ( )	MOTHER'S MAIDEN NAME (For use when you request special action taken on your account)	
PREVIOUS ADDRESS (If less than 3 years at current address)	CITY & STATE	ZIP CODE	
NATURE OF BUSINESS	BUSINESS PHONE ( )	ANNUAL SALARY $	OTHER INCOME (Which you rely on as a basis of repayment) $
EMPLOYER / POSITION / YEARS THERE	SOURCE OF OTHER INCOME (Alimony, child support, spousal income, or separate maintenance income need not be revealed if you do not wish it considered as a basis of repayment)		

CO-APPLICANT INFORMATION (If you wish an additional card issued to a co-applicant over 18 years of age complete the information below.)

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EMPLOYER / POSITION / YEARS THERE	BUSINESS PHONE ( )	ANNUAL SALARY $

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I have read this entire application, agree to its terms, and certify that the information is correct.

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Method of Computing the Balance for Purchases	Average Daily Balance (including new purchases)
Transaction Fee for Cash Advances and Fees for Paying Late Or Exceeding The Credit Limit	Transaction fee for bank and ATM cash advances: 2% of each cash advance, $2 minimum, $25 maximum Transaction fee for Access Check Cash advances: 1% of each cash advance, $2 minimum, $10 maximum Late Payment Fee: $15 Over the Credit Limit Fee: $15

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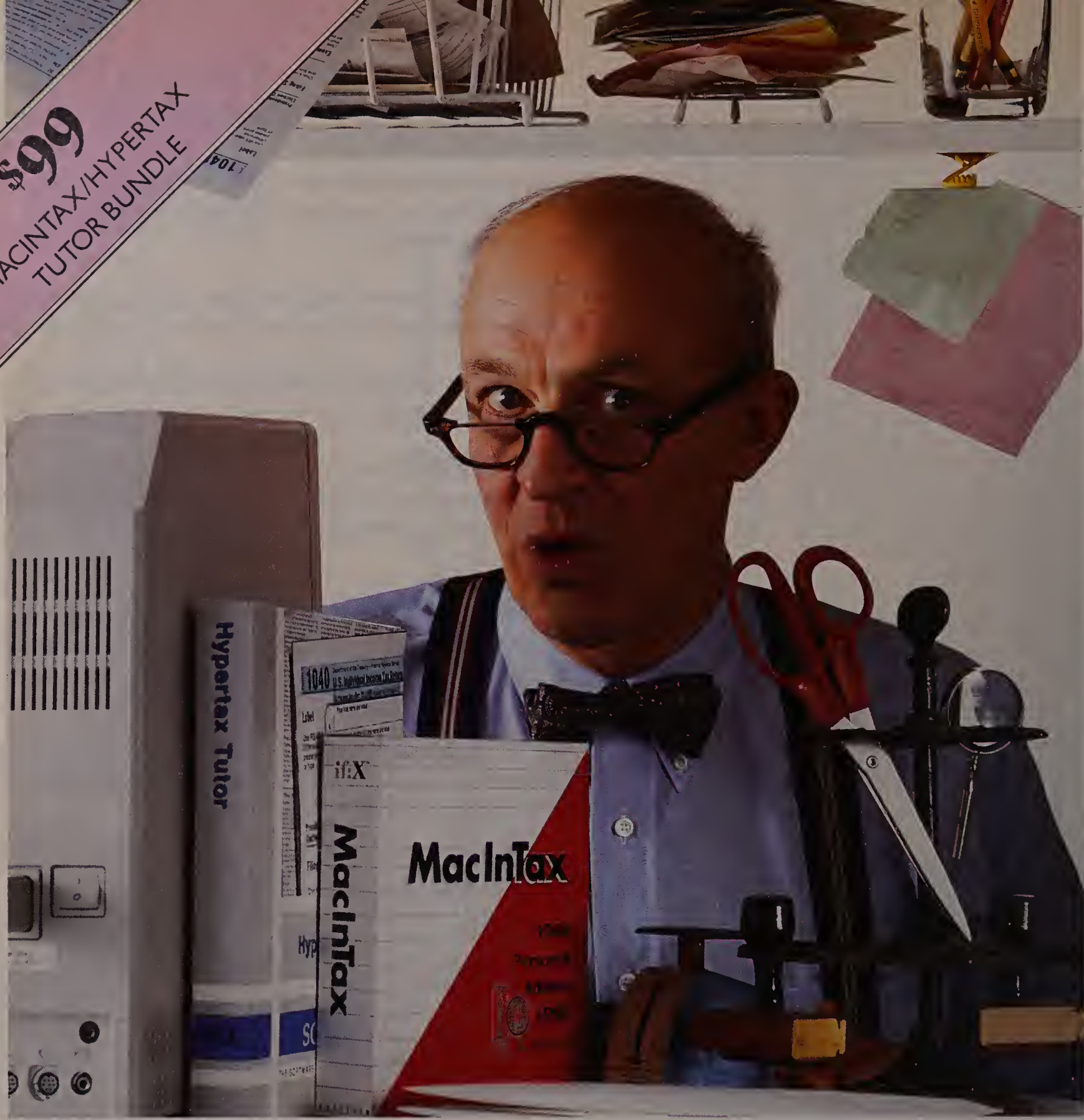

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Breeze through tax time with **MacInTax**, winner of a 1990 *Macworld* World Class Award. It displays and prints over 80 forms, schedules, and worksheets and even helps you figure out which ones to use. Best of all, it performs all those complex links and calculations *automatically*. Fully-integrated state supplements are available for CA, CT, DC, IL, MA, MD, MI, MN, NJ, NY, OH, PA, and VA.

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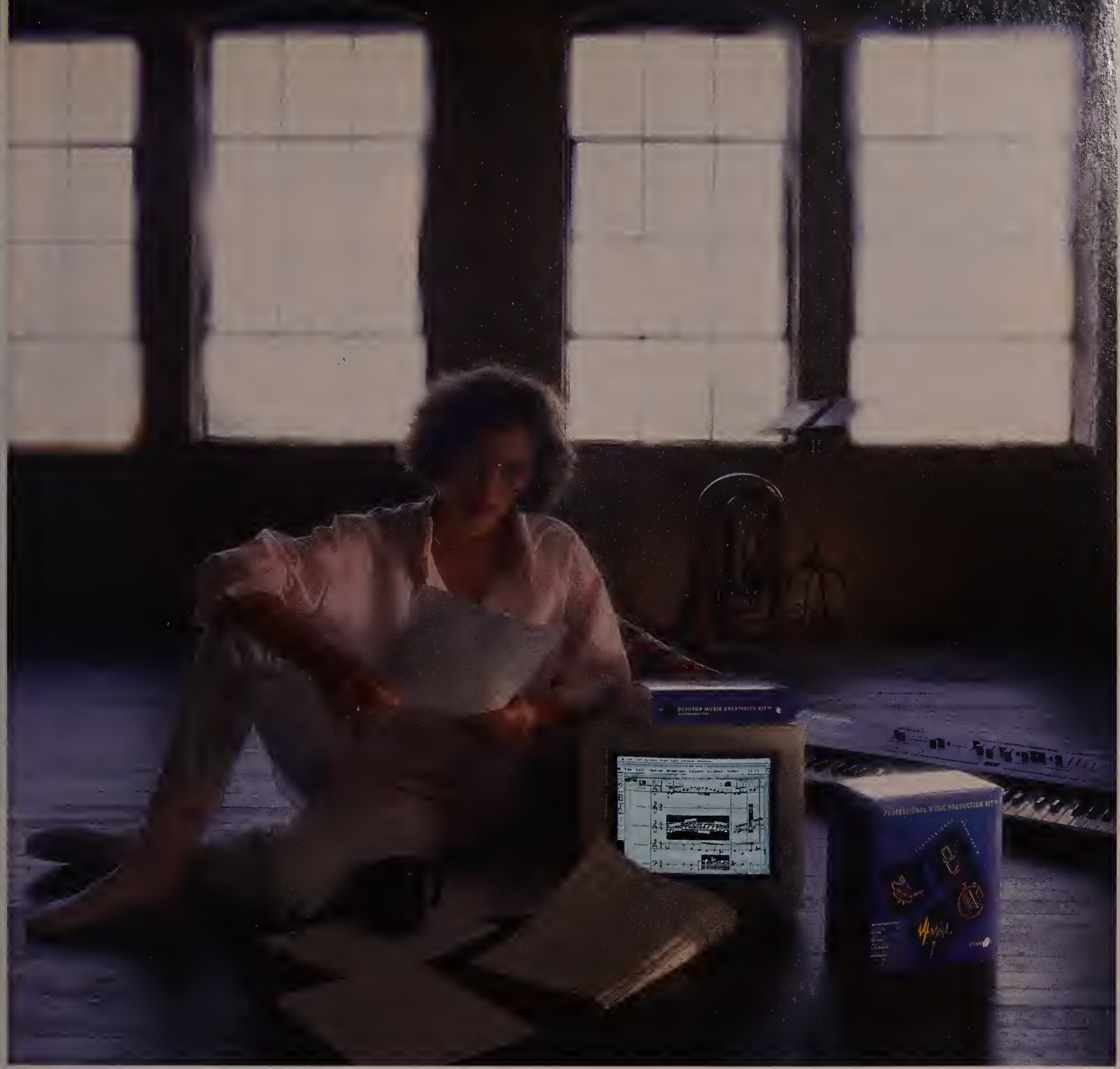

Compose yourself.

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The **Desktop Music Creativity Kit** is a great way to learn about MIDI and making music on the Mac. Multimedia producers can use it to add music to desktop presentations and teachers can present music in a variety of tempos/keys for study, learning parts, or rehearsal. It includes *TRAX* for MIDI recording, *HyperMusic* MIDI "jukebox", *Sound Exciter* 8-voice sample player, MIDI songs, and Apple's MIDI Manager.

Passport's **Music Production Kit** gives professionals the power to create multi-track recordings, frame-accurate sound tracks, custom sounds, and even produce sheet music. It includes *PRO 4* MIDI sequencer, *Encore* for composition/notation, *Alchemy* for audio editing, *Clicktracks* audio for video synchronization and the *HyperMusic* MIDI "jukebox."

Passport Designs

8254	Music Creativity Kit *(disk)*	**$189.**
8255	Music Creativity Kit *(CD-ROM)*	**189.**
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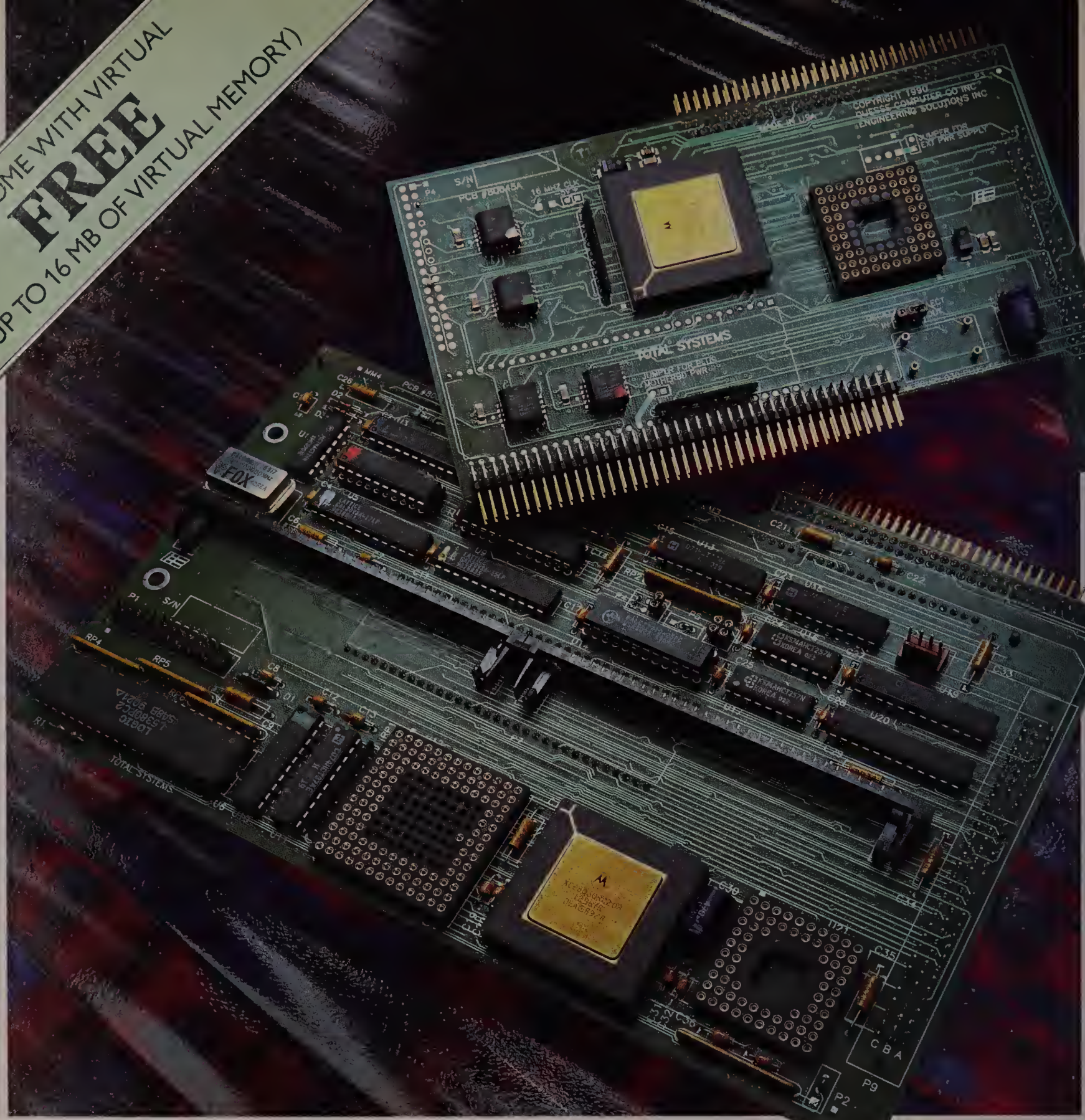

Mac be quick.

System 7 for older Macs.

Now any old Mac (128K through SE) can access the power of System 7 with the **Mercury 030** accelerator card. Its 16 MHz 68030 processor with built-in PMMU doubles performance and the modular design lets you further enhance your system with a 68882 math coprocessor, 32-Bit RAM, and/or high-speed SCSI expansion cards.

System 7 *and* super speed.

For System 7 compatibility and speeds that rival the IIci or even a IIfx, check out the **Gemini** line. Each board comes with PMMU standard and options including a 68882 math co-processor, 4MB of 32-bit RAM, and even large-screen video expansion for dual-screen compatibility. So you'll be able to keep that old Mac on the job for years to come.

Total Systems ... 30 day MBG

7817	16 MHz Mercury 030 for SE	**$389.**
8624	16 MHz Mercury for 128, 512, & Plus	**499.**
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Paracomp

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DayStar pushes your IIcx past a IIfx.

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DayStar Digital ... 30 day MBG

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8585 50 MHz PowerCache IIci ..... **1689.**

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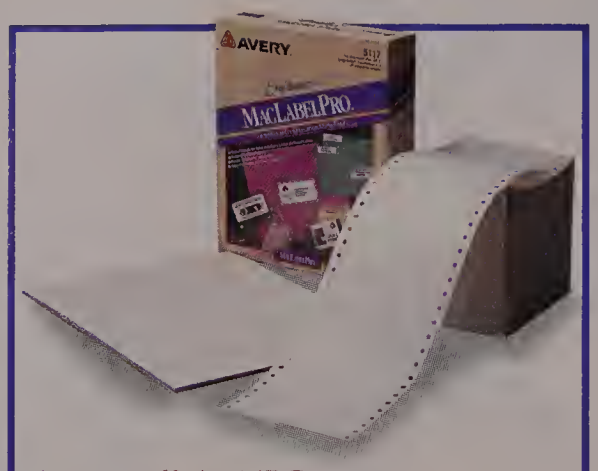

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7446 MacLabel Pro 1.0 . . . . . 49.
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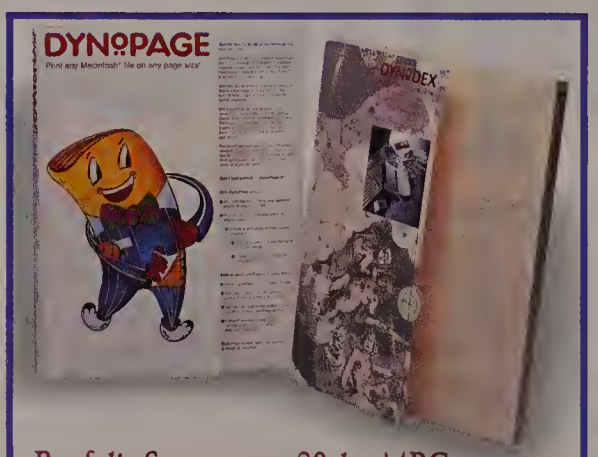

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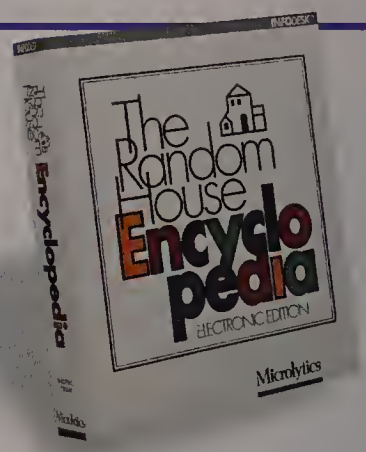

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8206 SmartBundle. . . . . 215.

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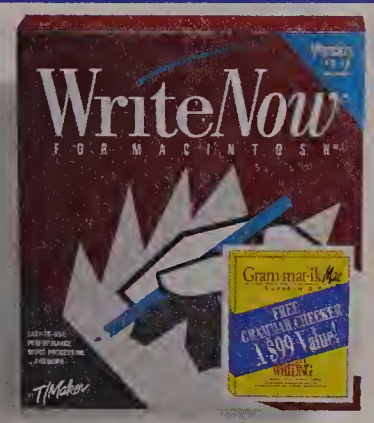

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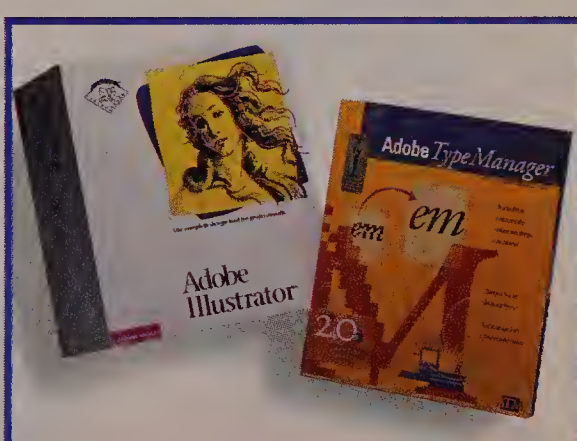

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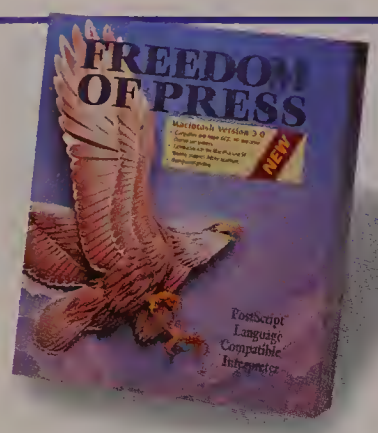

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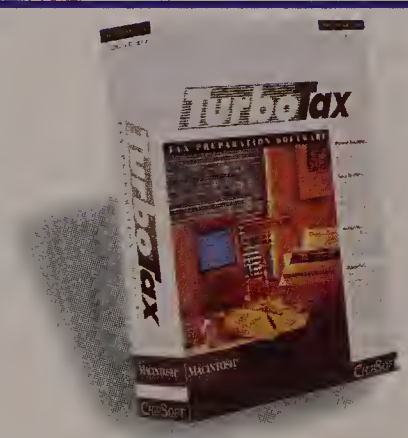

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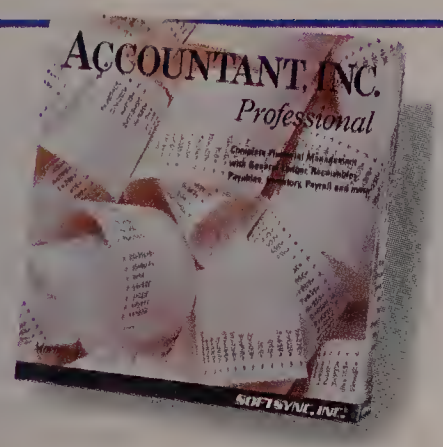

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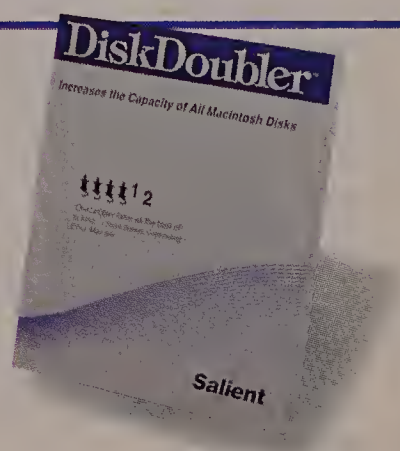

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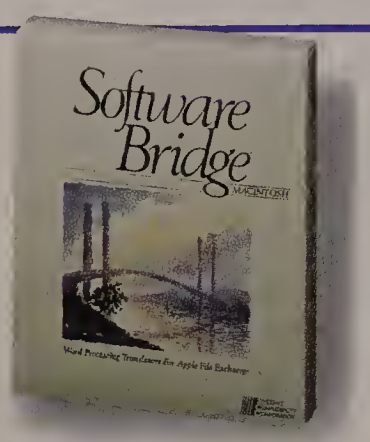

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Activision
5127 Manhole *(CD-ROM)* . . . . . 34.
8125 Cosmic Osmo *(CD-ROM)* . . . . . 46.
Broderbund Software
5237 Whole Earth Catalog *(CD-ROM)* . . . 89.
CD Technology
8057 CD-ROM Porta Drive . . . . . 649.
★**Farallon Computing ... 30 day MBG**
6767 MediaTracks Multimedia CD Pack . 319.
★**Highlighted Data ... 30 day MBG**
7771 Webster's Dictionary *(CD-ROM)* . . 159.

Nutmeg Systems ... 30 day MBG
The Nutmeg 19" Display—Delivers a flicker free, 72 dpi image. It features a tilt and swivel base; anti-glare screen. Please see line listings for grayscale and color Nutmeg products.
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7829 Learn to Speak Spanish *(CD-ROM)* 159.
★**MacroMind ... 30 day MBG**
7712 MacroMind CD-ROM . . . . . 125.
★**Microsoft ... 30 day MBG**
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NEC
Image Gallery, Type Gallery PS, Photo Gallery or Clip-Art 3D . . . . . ea. 246.
6744 CDR35 CD-ROM Portable Drive . . 399.
6743 Mac Driver Kit. . . . . 64.
★**Passport Designs ... 30 day MBG**
8255 Desktop Music Creativity *(CD-ROM)* 189.
8607 Music Production Kit *(CD-ROM)* . 1259.
★**Somak Software ... 30 day MBG**
LaserArt CD-ROM Vol. 1 or 2 . . ea. 62.
Toshiba
6749 XM 3201 CD-ROM Drive. . . . . 779.
★**Wayzata Tech. ... 60 day MBG**
8219 CD Funhouse. . . . . 35.
7966 U.S. Government Seals *(CD-ROM)* . 49.
7678 USA Factbook *(CD-ROM)* . . . . . 75.
7679 Disc Tracy Prog. Detective *(CD-ROM)* 75.
7965 Best of MacTutor *(CD-ROM)* . . . . . 99.

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8525 (B&W) . . . $41. *8524 (Color)* . . . $45.

7374 Sport News Baseball Stats *(CD-ROM)* $139.
7964 N. Amer. Facsimile Book *(CD-ROM)*. 269.

EDUCATION & RECREATION

Accolade
8221 Balance of the Planet . . . . . 29.
8217 Ishido: The Way of the Stones . . . . . 32.
8220 Jack Nicklaus Greatest 18. . . . . 34.
Activision
4486 Manhole. . . . . 28.
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★**Ars Nova ... 30 day MBG**
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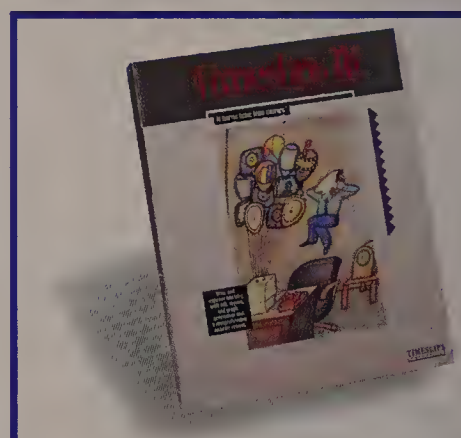
★**Baseline Publishing ... 30 day MBG**
7785 Talking Moose . . . . . 23.
★**Beacon Technology ... 30 day MBG**
HyperBible 2.0 *(KJ or NI)* . . . . ea. 125.
★**Bogas Productions ... 60 day MBG**
6135 Super Studio Session w/Music Library 99.
Bright Star Technology
1402 Alphabet Blocks 1.0 . . . . . 30.



TIMESLIPS ... 30 day MBG
2986 *Timeslips III 2.0*—Fast, easy, accurate time and billing for service professionals. DA stopwatch timer can be accessed while in other applications. Many new customization features. Network Edition coming soon $195.

Broderbund Software
4314 Type! 1.0. . . . . 18.
6516 The Playroom *(CP)* . . . . . 29.
Carmen Sandiego Series *(CP)*. . .ea. 29.
8266 SimEarth 1.0. . . . . 40.
4966 SimCity 1.2 *(CP)* . . . . . 29.
5871 SimCity Supreme 1.2C . . . . . 47.
Geom., Physics, or Calc. *(CP)* . ea. 58.
Bullseye
Ferrari *(CP)* or P51 Mustang *(CP)* ea. 31.
Carina Software
5726 Voyager 1.2 . . . . . 88.
★**Casady & Greene ... 60 day MBG**
2268 Crystal Quest 2.2 . . . . . 29.
Mission Starlight or Sky Shadow ea. 29.
Centron Software
8525 Casino Master *(B&W version)* . . . . . 41.
8524 Casino Master *(Color version)* . . . . . 45.
Coda Music Systems
8188 MusicProse 2.0. . . . . 299.
5604 Finale 2.5 . . . . . 549.
Davidson & Associates
1734 Math Blaster! 1.0 *(CP)*. . . . . 29.
6128 Math Blaster Mystery *(CP)*. . . . . 29.
8278 Alge-Blaster Plus . . . . . 35.

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8050 EARTHQUEST 1.0 . . . . . 48.
★Electronic Arts ... 30 day MBG
6716 Pipe Dreams 1.0 . . . . . 17.
6594 Starflight . . . . . 39.
★First Byte ... 30 day MBG
5294 Puzzle Storybook 1.0 *(ages 3-8)* . . . 27.
5293 Dinosaur Discovery Kit 1.0 *(ages 3-8)* 27.
★Great Wave ... 30 day MBG
KidsTime, Amer. Discov., KidsMath ea. 26.
4334 NumberMaze *(B&W)* 26. 8527 *(Color)* 36.
NumberMaze Decimals & Fractions
8043 *(B&W)* . . . . 26. 8044 *(Color)* . . . . 36.
2271 ConcertWare+ MIDI 5.1 . . . . . 98.
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(Span., Fren., Germ., Ital. & Rus.) ea. 29.

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(Spanish, French, German) . . . ea. 39.
6611 Kanjimaster - Beg. *(Japanese)*. . . . 105.
8026 Easy Kana . . . . . 139.
Individual Software
7425 Training for Microsoft Word 4.0 . . . . 35.
★Inline Design ... 30 day MBG
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7622 Darwin's Dilemma. . . . . 32.
★Learning Company ... 30 day MBG
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5453 Talking Math Rabbit 2.0 *(ages 4-7)* . 30.
★Leister Productions ... 30 day MBG
7126 Reunion 2.0 . . . . . 89.
★Microsoft ... 30 day MBG
2868 Flight Simulator 1.02 *(CP)* . . . . . 32.
Mindscape
4083 Balance of Power 1990 *(CP)* . . . . . 29.
★Mysterium Tremendum ... 30 day MBG
5841 Moriarity Revenge *(CP)*. . . . . 32.
★Nordic Software ... 30 day MBG
8258 Turbo Math Facts 1.1. . . . . 21.
8256 Hyper Control 1.2.1 . . . . . 31.
8260 Word Quest 1.0. . . . . 31.
8257 PreSchool Pack 1.0 . . . . . 36.
★Passport Designs ... 30 day MBG
8253 TRAX 2.0 . . . . . 59.
8254 Desktop Music Creativity Kit . . . . . 189.
3117 Master Tracks PRO 4 4.1.4. . . . . 319.
8246 NoteWriter II . . . . . 319.
8250 Encore 1.3.1. . . . . 379.
3115 MIDI Interface. . . . . 85.
★Penton Overseas ... 30 day MBG
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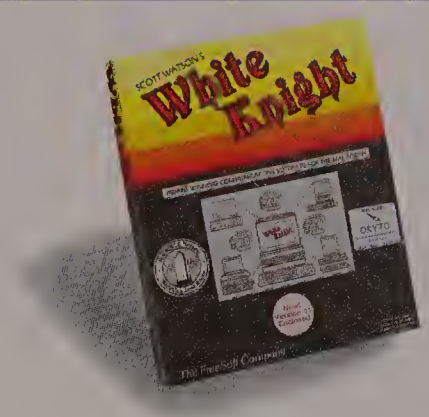
(French, Italian, Spanish, German, Russian, Hebrew, & Japanese). ea. 35.
★Personal Training Sys. ... 60 day MBG
PTS modules for Excel, Quark XPress, Persuasion, FileMaker II/Pro, PageMaker, Illustrator, FreeHand, Word, HyperCard, and the Mac . . . . . ea. 52.
Postcraft
6466 Citadel . . . . . 26.
Premier Technology
5773 Strategic Conquest Plus 2.055 . . . . 34.
5774 NetTrek—The Real Version 3.0 . . . . 34.
Sierra On-Line
3397 Leisure Suit Larry *(CP)* . . . . . 23.
★Softstream Int'l. ... 30 day MBG
4073 Colour Billiards . . . . . 38.
★Software Toolworks ... 30 day MBG
4619 Mavis Beacon Typing 1.3 *(CP)* . . . . 32.
4588 Life & Death *(CP)* . . . . . 32.
★Spectrum Holobyte ... 30 day MBG
3464 Tetris 1.1. . . . . 20.
6112 Welltris 1.1 . . . . . 20.
8180 Faces . . . . . 22.
8181 Vette! . . . . . 29.
3459 Falcon 2.2 . . . . . 30.
★Spinnaker ... 30 day MBG
2328 Sargon IV *(CP)* . . . . . 28.



Freesoft ... 60 day MBG
6115 *White Knight 11*–Supports XMODEM, YMODEM, ZMODEM, Kermit, and CompuServe Error Correcting protocols. Includes Okyto 1.0, a Mac-to-Mac file transfer program, and a free subscription to GEnie . $85.

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ACT, GMAT, GRE, or SAT Prep . ea. 29.
8098 LSAT Prep for the Mac . . . . . 35.
★Terrace Software ... 30 day MBG
8192 Mum's The Word . . . . . 81.
★Toyogo ... 30 day MBG
7624 Nemesis Go Master 4.7. . . . . 41.
7623 Nemesis Go Master Deluxe 4.7. . . . 88.
★XOR ... 30 day MBG
8061 MacSki . . . . . 40.
6040 MacGolf Classic *(CP)* . . . . . 52.
3815 NFL Challenge 1.03 . . . . . 55.

NETWORKS & COMMUNICATIONS

★Abaton ... 30 day MBG
6266 InterFax 24/96 Modem . . . . . 418.

Dow Jones ... 30 day MBG
5295 *News/Retrieval Membership Package*–Allows off-line setup of personalized reports to retrieve and analyze key data from Dow Jones News/Retrieval's 55+ databases. Includes five free hours of connect time . . . . . $24.

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Applied Engineering
8365 DataLink Express . . . . . 175.
8364 DataLink/Mac . . . . . 209.
8363 DataLink/Mac Portable . . . . . 209.

★Beagle Bros. ... 30 day MBG
7691 Flash 1.1 . . . . . 127.

★CE Software ... 60 day MBG
5173 QuickMail 2.2.3 *(10 user)* . . . . . 315.

★CompuServe ... 60 day MBG
1676 Macintosh Membership Kit . . . . . 23.
1673 CompuServe Navigator 3.0 . . . . . 49.
1674 Membership Kit/Navigator Bundle . 69.

★DataViz ... 60 day MBG
1823 MacLink Plus/PC 4.5 . . . . . 117.
4842 MacLink Plus/Translators 4.5 . . . . . 98.

★Dove Computer ... 60 day MBG
6758 DoveFax Desktop . . . . . 299.

★Dow Jones ... 30 day MBG
5295 News/Retrieval Membership Package 24.

EveryWare
8077 AllShare 1.0 . . . . . 139.

★Farallon Computing ... 30 day MBG
5707 Timbuktu 3.1 . . . . . 95.
4867 Timbuktu 3.1 30-Pack . . . . . 1285.
4866 Timbuktu/Remote 2.0 . . . . . 123.
6371 Timbuktu/Remote Access Pack . . 845.
6273 PhoneNET StarConnector 10-Pack . 129.
4869 PhoneNET Connector 10-Pk *(DIN-8)* 198.
2206 PhoneNET StarController 300 . . . . . 825.
6687 PhoneNET StarController-EN . . . . 1599.
6766 MediaTracks . . . . . 189.
6768 MediaTracks Multimedia Pack . . . . 319.

★Freesoft ... 60 day MBG
6115 White Knight 11 . . . . . 85.

Hayes
2300 Smartcom II 3.2 . . . . . 84.
2307 Smartmodem 2400 . . . . . 349.
5991 V9600 Baud Modem . . . . . 719.

Information Presentation Tech.
8060 Personal Server Network *(PSN)* . . . 108.

Insignia Solutions
7557 Access PC 1.0 . . . . . 62.
7058 SoftPC-AT/EGA Module . . . . . 125.
4089 SoftPC 1.3 . . . . . 245.

Intel Corporation
5119 2400EX Modem . . . . . 179.
6420 2400EX MNP Modem . . . . . 229.
6650 2400EX MNP with QuickLink II . . . 249.

★Int'l. Bus. Software ... 30 day MBG
8581 DataClub *(3 user)* . . . . . $199.

★Kennect Tech. ... 30 day MBG
5631 Rapport . . . . . 195.
7588 Drive 360 . . . . . 249.
7590 Drive 1200 . . . . . 249.
5632 Drive 2.4 *(includes FastBack II)* . . . 325.

★Microcom ... 30 day MBG
7459 CarbonCopy Mac *(Single, 2 req.)* . 117.
7465 CarbonCopy Mac *(Twin Pack)* . . . . 169.
8027 MacModem V.32 . . . . . 689.

★Nuvotech ... 60 day MBG
3000 TurboNet ST *(DIN-8)* . . . . . 30.
6751 TurboNet ST *(12-Pack)* . . . . . 279.
6750 NuvoLink II . . . . . 275.
6272 NuvoLink SC . . . . . 309.

★Orchid Technology ... 30 day MBG
6949 OrchidFAX Modem . . . . . 429.

★Practical Peripherals ... 30 day MBG
3102 2400 Baud External Modem . . . . . 179.
5285 PM 2400SA MNP Modem . . . . . 209.
3089 Mac Communications Pack 1.5 . . 225.

★Prometheus ... 30 day MBG
8350 2400 Mini for Mac . . . . . 169.
8348 24/96 Minifax . . . . . 199.
8349 Maxfax . . . . . 295.

Farallon Computing ... 30 day MBG
6766 *MediaTracks*–Lets you record Macintosh screen activities into "tapes." You can easily edit and add text, graphics, and sound to your tapes, which your audience can watch and listen to at their convenience . . . . . $189.

★Shiva ... 30 day MBG
3444 NetSerial X232 . . . . . 275.
4347 NetBridge . . . . . 339.
4942 TeleBridge . . . . . 339.
3443 NetModem V2400 . . . . . 429.
6917 NetModem V.32 . . . . . 1395.
6519 EtherGate . . . . . 1629.
8189 FastPath IV . . . . . 1899.

★Sitka/TOPS ... 30 day MBG
4188 TOPS Teleconnector *(DIN8)* . . . . . 23.
3720 TOPS Flashcard . . . . . 155.
6264 TOPS Networking Bundle 3.0 . . . . 187.

★Software Ventures ... 30 day MBG
3455 MicroPhone II 3.0 . . . . . 215.

★Solutions, Inc. ... 60 day MBG
6720 FAXGATE Plus 1.1 . . . . . 239.
8337 CommGate . . . . . 379.

★Synergy ... 30 day MBG
6618 VersaTerm 4.1.1 . . . . . 88.
6619 VersaTerm-PRO 3.1.1 . . . . . 174.

★Traveling Software ... 60 day MBG
3729 LapLink Mac III Connectivity Pac . . 93.

Kennect Technology ... 30 day MBG
Drives–Owners of any Macintosh (512e-IIci) can get complete compatibility with all IBM and Apple formats by plugging one or more of Kennect's 3½" or 5¼" drives into Rapport. . . . . **see line listing for prices.**

INPUT/OUTPUT

★Abaton ... 30 day MBG
7432 Scan 300/GS *(reqs. Scan Kit)* . . . . 999.

★American Power ... 30 day MBG
5895 UPS 110SE . . . . . 209.
6686 UPS 370ci . . . . . 329.

Caere
8124 Typist . . . . . 479.
4476 OmniPage 2.1 . . . . . 539.
6660 OmniSpell 1.0 . . . . . 69.
6658 OmniDraft 1.0 . . . . . 69.

★CH Products ... 30 day MBG
7343 Mach IV Plus Joystick *(Quad or ADB)* 51.
7344 Rollermouse *(ADB)* . . . . . 79.

Computer Friends
8271 ColorSnap 32+ . . . . . 649.

★CoStar ... 30 day MBG
6090 LabelWriter . . . . . 185.
6067 LabelWriter Labels . . . . . 11.
7452 LabelWriter Labels *(12-Pack)* . . . . . 63.

★Datadesk ... 30 day MBG
6901 Switchboard *(modular keyboard)* . 159.
MAC-101 Keyboards . . . . . ea. 129.

Software Ventures ... 30 day MBG
3455 *MicroPhone II 3.0*–1990 Macworld World-Class Award for *Communications-General*. New version of top-selling telecom software. Build graphic front-ends to remote services and corporate mainframes . . . . . $215.

really seem great.

DayStar Digital
8556 Fast Cache for Mac IIci . . . . . $279.
8586 40 MHz PowerCache IIci. . . . . 949.
8585 50 MHz PowerCache IIci. . . . . 1689.
8583 SCSI PowerCard. . . . . 949.
25 MHz PowerCard 030 *(II or IIx)* ea. 1095.
8572 25 MHz PowerCard 030 *(IIcx)*. . . . . 1495.
40 MHz PowerCard 030 *(II or IIx)* ea. 1399.
8566 40 MHz PowerCard 030 *(IIcx)*. . . . . 1749.
50 MHz PowerCard 030 *(II or IIx)* ea. 1895.
8563 50 MHz PowerCard 030 *(IIcx)*. . . . . 2269.

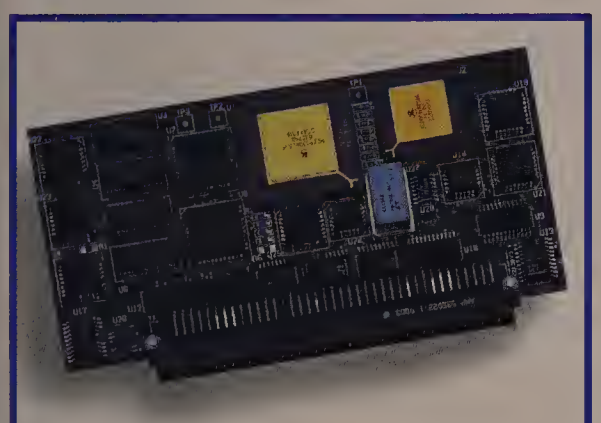
GDT Softworks
6256 PrintLink Collection 4.0. . . . . 59.
6151 JetLink Express 2.0 . . . . . 89.

Hewlett-Packard
6514 HP DeskWriter Printer. . . . . 759.
6582 HP LaserJet IIP *(with toner)*. . . . . 1069.
6754 HP LaserJet III *(with toner)* . . . . . 1699.

★Kensington ... 30 day MBG
Turbo Mouse 3.0 *(Plus or ADB)* ea. 109.

Koala
2593 MacVision 3.0. . . . . 259.

Kodak
6730 DICONIX M150 Plus Printer . . . . . 489.



DayStar Digital
PowerCache IIci—Go faster than a Mac IIfx! New 40 and 50 MHz turbo charged cache cards for the Mac IIci. Turns your computer into the fastest Mac alive! . . . **see line listing.**

★Kraft Systems ... 60 day MBG
7519 KM30 ADB Joystick . . . . . 42.

★Logitech ... 30 day MBG
5082 ScanMan Mac Model 32. . . . . 319.

Magnavox
6693 9CM080 14" Color Monitor. . . . . 529.
6690 14" Color Monitor with Micron Xceed for SE/30 *(640 x 480)* . . . . *special* 849.

MegaGraphics
16" 8-bit System for SE/30 or II. ea. 2695.
7841 16" 24-bit Color System for Mac II 4995.
19" Rival Sys. SE, SE/30, or II. . ea. 1269.
19" 8-bit System for SE/30 or II. ea. 4395.
7840 19" 24-bit Color System for Mac II 6795.
19" G/S System for SE/30 or II ea. 1995.

★Micron ... 30 day MBG
7149 Xceed IIci-128 Cache Card. . . . . 269.
6680 Xceed for SE/30 *(640 x 480)* . . . . . 329.

★MicroSpeed ... 30 day MBG
6620 MacTRAC. . . . . 62.
6621 MacTRAC ADB . . . . . 75.

★Mouse Systems ... 30 day MBG
7560 Trackball ADB. . . . . 69.
Little Mouse or Little Mouse Plus. ea. 75.

TheComplete PC
6103 *TheComplete Page Scanner*—Scans images up to 14" long and saves files in popular image formats. Powerful SmartScan software handles up to 256 shades of gray so you can easily edit and manipulate photographs . . . . . **$758.**

★Nutmeg Systems ... 30 day MBG
7920 SE/30 Color Video Interface . . . . . 339.
15" Monitor: SE, SE/30, II or IIsi ea. 599.
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8318 19" Monitor: Gray-Scale for Mac II 1295.
8319 19" Monitor: w/8-bit card for Mac II 2595.

★Orange Micro ... 30 day MBG
3036 Grappler *(9 pin)* . . . . . 87.
6229 Grappler LX . . . . . 128.

Pacific Data Products
7412 Pacific Page PE 4.0 for the Mac . . 529.

RasterOps
8526 Video Expander . . . . . 529.
7463 ColorBoard 264 for Mac II. . . . . 579.
7469 ColorBoard 264 for SE/30. . . . . 689.
7457 Video ColorBoard 364 . . . . . 975.
7468 ClearVue/GS System for Mac II . . 1699.

SAFE Power Systems
4561 250 Watt . . . . . 199.

★Sophisticated Circuits ... 30 day MBG
8009 PowerKey . . . . . 65.
8008 PowerKey Wake-Up Cable . . . . . 32.

TheComplete PC
6104 Half-Page Scanner/400 . . . . . 295.
6103 Full-Page Scanner . . . . . 758.

MegaGraphics
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Thunderware
3648 ThunderScan Plus ThunderWorks $199.
4994 LightningScan 400. . . . . 385.

Total Systems
7817 16 MHz Mercury 030 *(for Mac SE)*. 389.
7816 20 MHz Gemini 030 . . . . . 799.
7814 33 MHz Gemini II 030 . . . . . 1199.
8371 40 MHz Gemini II 030 . . . . . 1339.
7818 50 MHz Gemini II 030 . . . . . 1599.

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8316 2 Meg SIMMs Set *(80ns)*. . . . . 99.
7497 1 Meg SIMMs for Mac IIfx *(80ns)*. . . call

Applied Engineering
8360 800k Drive . . . . . 195.
8361 1.44 Meg High Density Drive . . . . 229.
8369 MacRam Portable with 1 MB. . . . . 399.
MacRam Classic with 0, 1, or 3 MB. call

Cutting Edge ... 30 day MBG
Cutting Edge Hard Drives are fast and reliable with access times as low as 23 milliseconds and a mean time between failure rating of up to 100,000 hours. An outstanding combination of quality and low price. . . . . **see line listing.**

★Cutting Edge ... 30 day MBG
3989 800K External Disk Drive . . . . . 149.
5133 20+ Meg Hard Drive . . . . . 329.
3990 30+ Meg Hard Drive . . . . . 389.
3991 45+ Meg Hard Drive . . . . . 449.
5275 60+ Meg Hard Drive . . . . . 489.
5276 80+ Meg Hard Drive . . . . . 539.
5456 45 Meg Removable Drive . . . . . 699.

★Dove Computer ... 60 day MBG
MaraThon 030 for Plus, SE or II ea. 529.
8186 MacSnap 524XE. . . . . 199.
8187 MacSnap 524XS . . . . . 269.

★Pacific Rim ... 30 day MBG
7382 Platinum 800k Drive . . . . . 145.

Peripheral Land, Inc. (PLI)
8335 PLI TurboFloppy 1.4 . . . . . 299.
8334 PLI SuperFloppy 1.4. . . . . 449.
8333 PLI Sony 40 Turbo Ext. Drive. . . . . 469.
8336 PLI DOS Floppy . . . . . 469.
8327 PLI Infinity 40 Turbo . . . . . 749.

Quantum
40 Meg & 80 Meg Internal Drives for Mac SE, SE/30, IIx, IIfx, IIci & IIcx . . call

SuperMac Tech.
7451 Dataframe XP 200 Hard Drive. . . 1399.
5451 Dataframe XP 330 Hard Drive. . . 2249.

24 hours weekdays.

Sopris Softworks ... 60 day MBG
SE Protection Pack–Includes a High Trek Carry Case, featuring ¾" high-density foam and a Cordura outer shell, along with a water-resistant, anti-static Mac SE cover, and their Gallery 20 Disk Easel ..... see line listing.

ACCESSORIES

Apple Computer

6717 MIDI Interface ..... 84.
7746 Personal LaserWriter Toner Cart. ... 89.
1114 LaserWriter Plus Toner Cartridge. .. 99.
1115 LaserWriter II Toner Cartridge .... 105.

★**Avery ... 60 day MBG**

4607 Laser Labels 1" x 2⅝" *(Qty. 3000)* ... 24.
4864 Disk Labels 3½" *(Qty. 250)* ..... 13.
5392 Disk Labels 3½"-Laser *(Qty. 630)* .. 29.
4865 Address Labels 3½" x 15/16" *(3750)* . 15.
4811 Transparencies 8½" x 11" *(Qty. 50)* .. 22.

★**Basic Needs ... 60 day MBG**

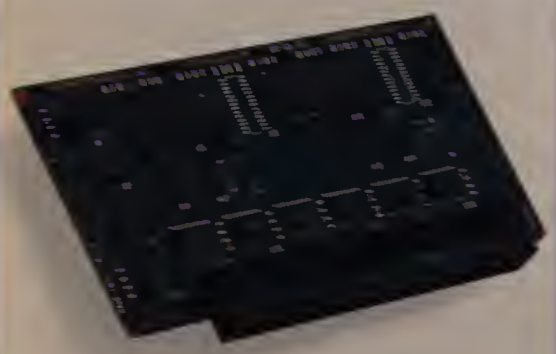
Dust Covers ..... call
Hard Top Keyboards ..... ea. 15.
7413 Mac IIcx/ci Monitor Stand ..... 40.
7417 Cordless Mouse ..... 89.

★**Computer Coverup ... 60 day MBG**

1723 ImageWriter II Cover ..... 8.
1725 Mac SE Ext. Keyboard Cover set. .. 10.

★**CoStar ... 30 day MBG**

7453 The Organizer Jr. ..... 79.
6091 The Organizer. ..... 199.



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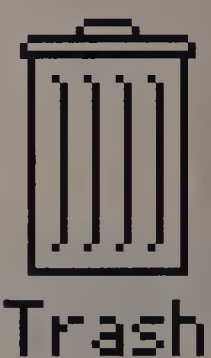

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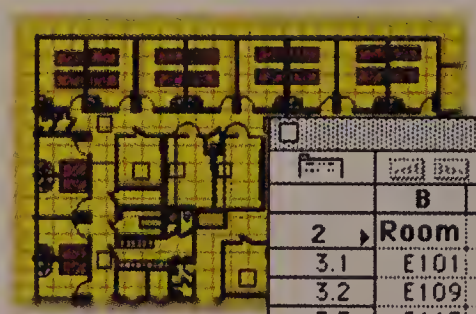

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ART BEAT

by Cathy Abes

The tools and the talent behind Macworld's graphics and the techniques that make them possible

Artist: When Steve Lyons began his career as an illustrator ten years ago, he did acrylic painting using an airbrush. About a year ago he tried using the Mac in his work, and he's never looked back. Now all his artwork is Mac generated.

Hardware: Mac II with 8MB of RAM, 120MB internal hard drive, Wacom pressure-sensitive tablet.

Software: Adobe Illustrator 3.0, Adobe Photoshop 1.06.

How It Was Done: For the illustration depicting the long-awaited Adobe Illustrator 3.0 that opens this month's *Reviews* section, Lyons used—appropriately enough—Illustrator 3.0. "I wanted to create a richly textured background (reminiscent of Japanese paper) to contrast with the hard edges of the linear elements in the illustration," he said. To that end, he used Adobe Photoshop to make an EPS file, which could then be imported into Illustrator.

Working in Photoshop, Lyons first filled the drawing area with a brownish green color and then began drawing the squiggly lines using the brush tool and the Wacom tablet. After he had drawn a number of squiggly lines, he used Photoshop's Motion Blur filter (Filter submenu under the Image menu) to give the image a fuzzy texture. Then he added more squiggles until he had a fabriclike texture.

After converting the image from RGB to CMYK mode, Lyons began working in the black channel so he could add a subtle black grainy texture to the background (using the Add Noise filter). Then he saved the image as an EPS file in the Desktop Separations mode. This separated the

(continues)

The background after the artist had added a color fill and drawn a few of the squiggly lines.

The background after more lines were drawn and the Motion Blur filter was used to add a fuzzy effect.

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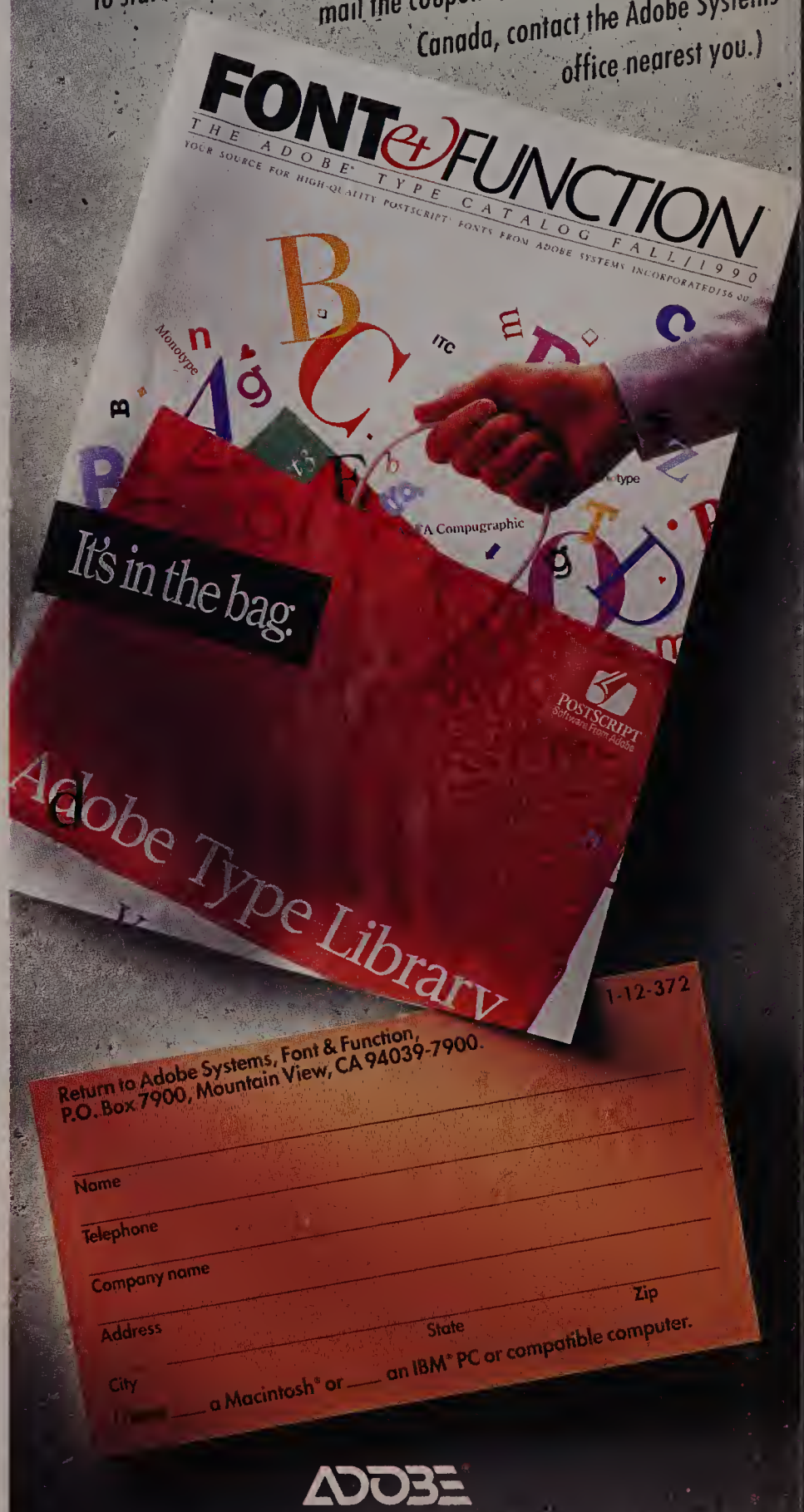

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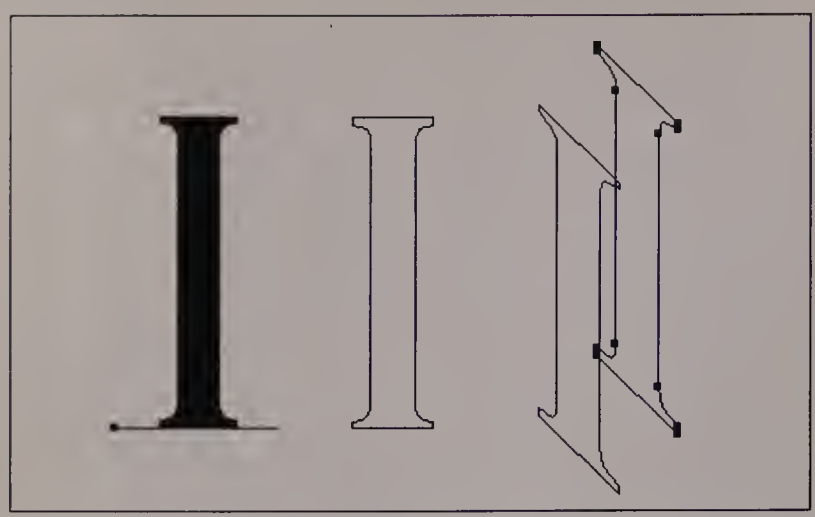


From left, the original Copperplate *I*; the *I* after it had been converted to an outline; the *I* after it had been skewed, cloned, and dragged.

The finished three-dimensional *I*.

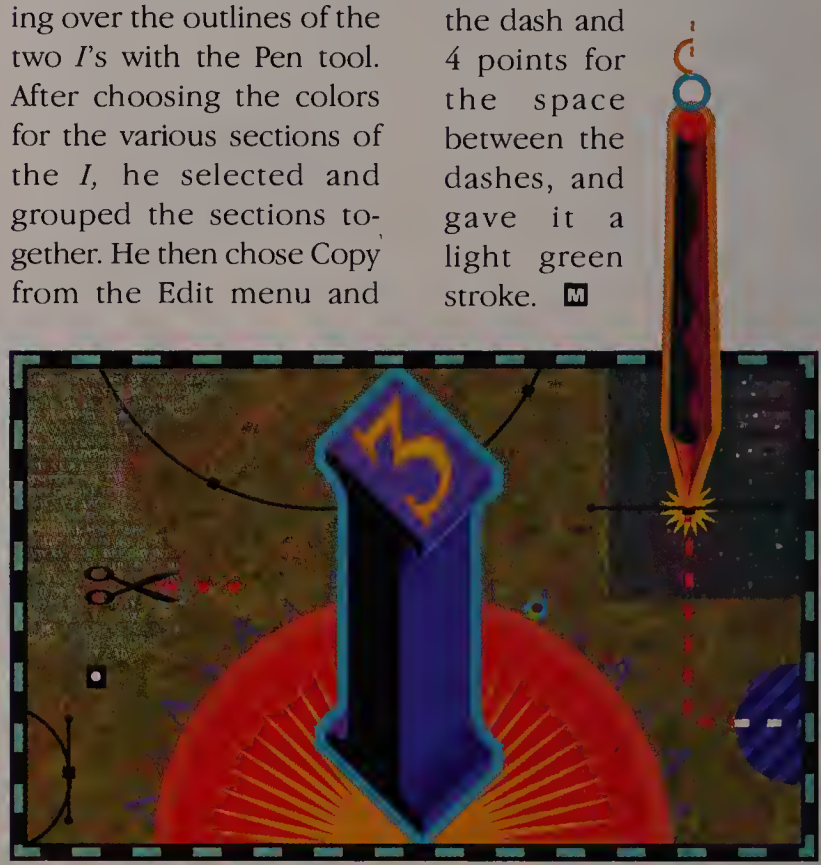
image into five files that could be placed in and printed from Illustrator.

Now he was ready to create the rest of the image in Illustrator 3.0. Using Illustrator's Place Art command, he imported the background files from Photoshop.

Next he focused on the central element of the composition: the three-dimensional *I*. He chose the Copperplate typeface as a model for the serifs of the *I*. After creating an *I* with the right proportions, Lyons used Illustrator 3.0's new Create Outlines command to convert the *I* from a font into a graphic that could be manipulated like any other PostScript object. This made it possible for him to use Illustrator's Snap to Point feature so he could accurately align the different sections of the *I*.

Lyons selected and skewed the *I* using the Skew tool (while holding down the Shift key to constrain to vertical motion only). He then cloned the *I* by selecting and dragging while holding down the Shift and Option keys. Because he wanted the cloned *I* to function only as a guide for placing the top and sides of the *I*, he gave it no fill and no stroke. With the Snap to Point option selected in the Preferences dialog box, Lyons created the sides and top by drawing over the outlines of the two *I*'s with the Pen tool. After choosing the colors for the various sections of the *I*, he selected and grouped the sections together. He then chose Copy from the Edit menu and Paste Behind from the Arrange menu to create a duplicate of the grouped *I* sections directly behind the original. Without ungrouping this new *I* he called up the Paint dialog box, choosing no fill and a light blue for the stroke. He also selected rounded joins (to smooth the corners around the entire *I*) and assigned a line weight of 6 points (since it was behind the original *I* only 3 points of the new *I* would show). This technique allowed him to put an even 3-point stroke around the entire three-dimensional *I*.

After finishing the other elements, Lyons created the dashed border surrounding the illustration. He achieved the border's two-color effect by first specifying a solid black line with a 5-point line weight. He then used Copy and Paste in Front to put a duplicate of the line directly on top of its predecessor. Finally, he called up the Paint dialog box and assigned the new line a stroke weight of 3 points, a dashed value of 6 points for the length of the dash and 4 points for the space between the dashes, and gave it a light green stroke. ■



The final illustration.

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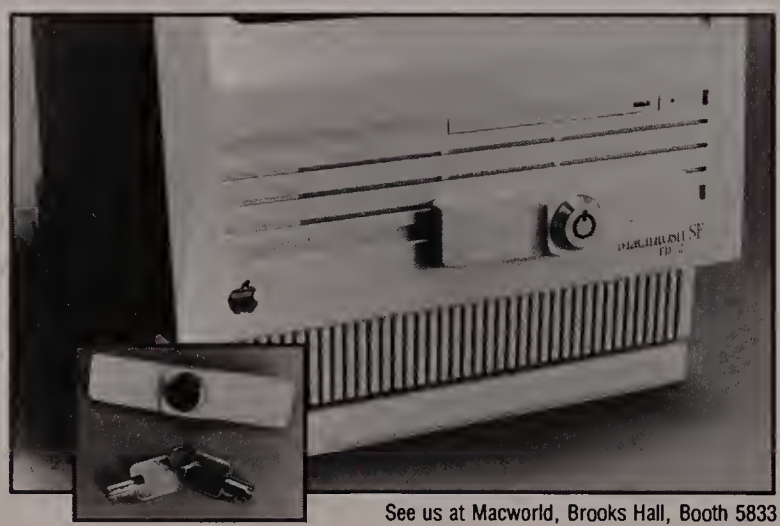

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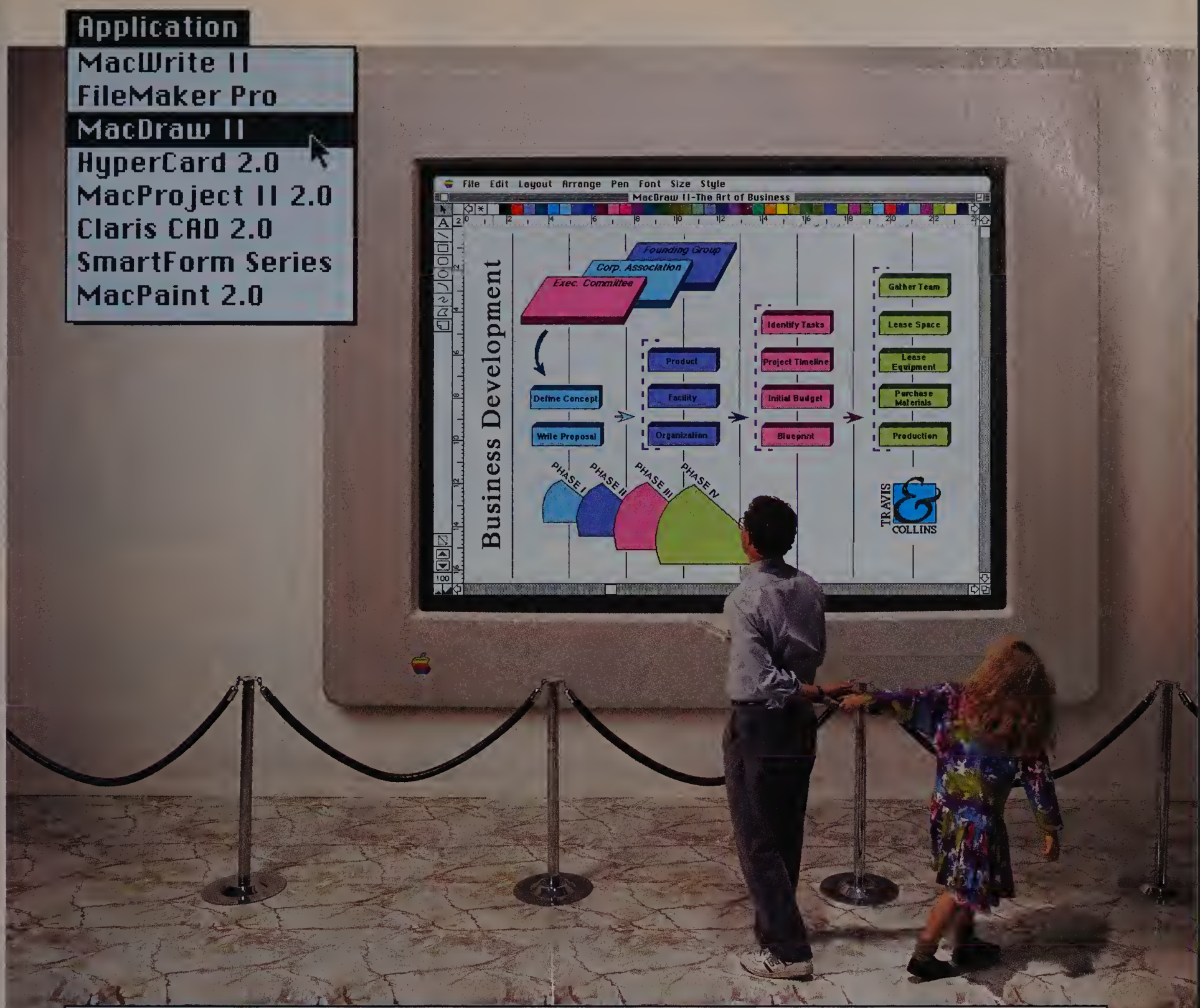

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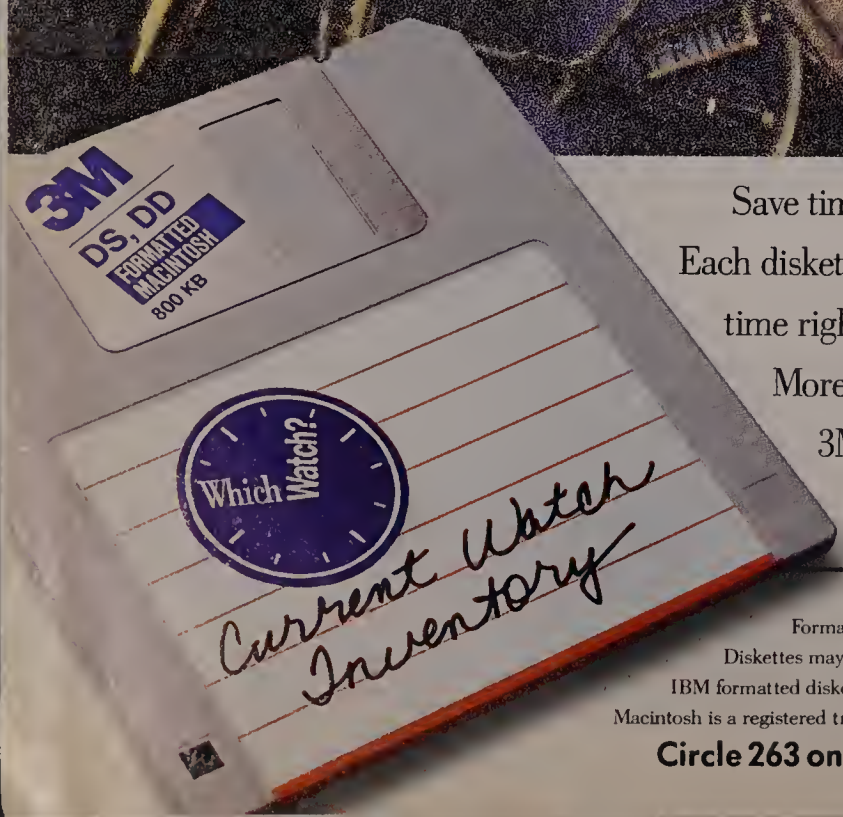

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Outbound and Gagged

A small company's future is in Apple's hands

BY STEVEN LEVY

It was two Augusts ago that many of us became acquainted with what is now known as the Outbound portable. One by one the Macintosh cognoscenti snuck out of the Macworld Expo festivities and negotiated their way to a ground-floor hospitality suite in a Boston hotel. We found a group of executives wearing Cheshire-cat smiles, obligingly demonstrating what most everyone said was pretty much impossible in the summer of 1989—a true Macintosh laptop at a reasonable price. It was then called the Wallaby, acknowledging its marsupial talent of "docking" to a mother Macintosh.

Oh, we tried to hide our enthusiasm. We circled the machine—not much of a walk was required, since the computer was no bigger than a reference book, say, the *Baseball Encylopedia*—and we banged on its keyboard, tickled its pointing device, and pondered its backlit screen. If not everything seemed to work perfectly, we were assured that the product that eventually shipped would remedy those faults.

Then we asked our questions: How can you do this without Apple suing you? *We aren't selling Apple's proprietary technology—the Macintosh ROMs,* came the answer. *Those you supply yourself, in a Mac Plus or Mac SE, which becomes the docking device once the ROMs are transferred to the laptop.* People have to provide their own ROMs? *Yes, they can buy new computers, or bring in old Macs that would otherwise have been upgraded or discarded. Or they can find used Macs.* And you're sure that Apple won't stop you? *It's perfectly legal!*

We walked away with our hearts all aflutter. And our enthusiasm only increased when, a few months later, Apple Computer released its own pathetic version of a portable computer—a bulky, overpriced beast. Sure the Outbound, as it was finally called (because of a trademark conflict with Wallaby) upon its release last April, had a problem or two, but at least its designers were living on the same planet as their potential customers. The Outbound was light enough to carry along on a trip, compact enough to use on an airplane, inexpensive enough to buy with a mere five-thousand-dollar bill—and you'd get back a nice piece of change.

But is the Outbound really bound for glory? Is the company destined to be a big player in the Macintosh community? Should you buy one? The product has now been selling for almost a year, and I have some big doubts. Compounding the uncertainty is an extremely oblique announcement made by Apple Computer last summer, regarding, as a press release states, "Outbound's infringement on Apple's intellectual property rights." Apple stated that it now "allows" Outbound to sell its products. However, again quoting the press release, "specific details of the agreement were not made public." One detail that was most certainly *not* in the agreement, though, was the one

that Outbound officials wanted most: the ability to package Apple's ROMs with their computer.

Born to ROM

Why was this crucial? Because without it, Outbound, even with the Apple agreement, is a quasi product, a curiosity rather than a complete computer. The protocol for buying an Outbound would make Rube Goldberg proud. You don't just saunter into a dealer, plunk down your cash, and walk off with a laptop. You must also buy, or otherwise provide, a Plus or an SE, from which the Outbound dealer extracts the ROMs and installs them in the Outbound. You return home with two computers, sort of: the Outbound and a "lobotomized" Mac that works only when docked to the newly loaded Outbound. Presumably, users will work on the docked setup at home, taking the laptop on the road.

This sounded all right when they explained it to us in Boston 18 months ago, but in the cold light of reason, the scheme is flawed. At Outbound's prices—$3000 for a floppy

(continues)

disk version, $4000 for a hard drive machine, and a few hundred more for various extras, some of them essential—it's clear that Outbound customers aren't the types who have Mac Pluses on their desktops. No, they're power users, hooked on Mac IIs, and the wimpy Macintoshes they plundered for the ROMs might as well be used as high-tech piñatas.

No wonder then, that some Outbound dealers operate in violation of Outbound policy, offering to sell prospective customers laptops complete with ROMs. Though Apple Computer has a problem with this—the company refers to ROMs in this situation, no matter where their origin, as "pirated"—the dealers are often quite brazen about the practice.

In preparing this column I called three Outbound dealers, describing myself as someone who had a Mac II and no interest in using a less powerful machine on the desktop. Did this mean I had to buy a Plus or an SE? I figured if any of the dealers was cheating on the rules, they would probably not deal with me on the phone, but I was wrong. The first dealer, not affiliated with Apple, said not to worry, he would sell me ROMs for $180. The second, who was an Apple dealer, also assured me that there was no problem, and ROMs would cost $150 extra. Only the third seller, also an Apple dealer, told me that I was out of luck; according to the official procedure, I must supply a Mac Plus or an SE. However, this dealer offered me a floor model of the Outbound, along with the Mac Plus that was on display. The discount was considerable. Why? "Because we're not moving the product and we want to clear out inventory."

At first blush, it would seem good news that one can buy the Outbound complete with ROMs for only a pittance more than the original price. But many users, particularly corporate buyers, are understandably wary of a scheme that circumvents standard company policy—both Apple's and Outbound's. Robert B. Louthan, the chief operating officer of Outbound, sounded quite glum when I described my experience to him. "The dealers' instructions are to follow the installation procedure," says Louthan. And if they don't? "We [can't] control them," he says.

While not disclosing any sales figures, Louthan contends that Outbound is doing quite well, selling computers "ahead of our plan." But he admits that his company's fortunes would be considerably improved if Outbound were allowed to sell Apple ROMs along with the computer. "It's a market resistance point, for sure. We feel we could better serve our customers if our relationship with Apple were broader."

In the meantime, many Outbound dealers are apparently using sleight of hand as a way of getting machines out the door. That doesn't inspire confidence in a company.

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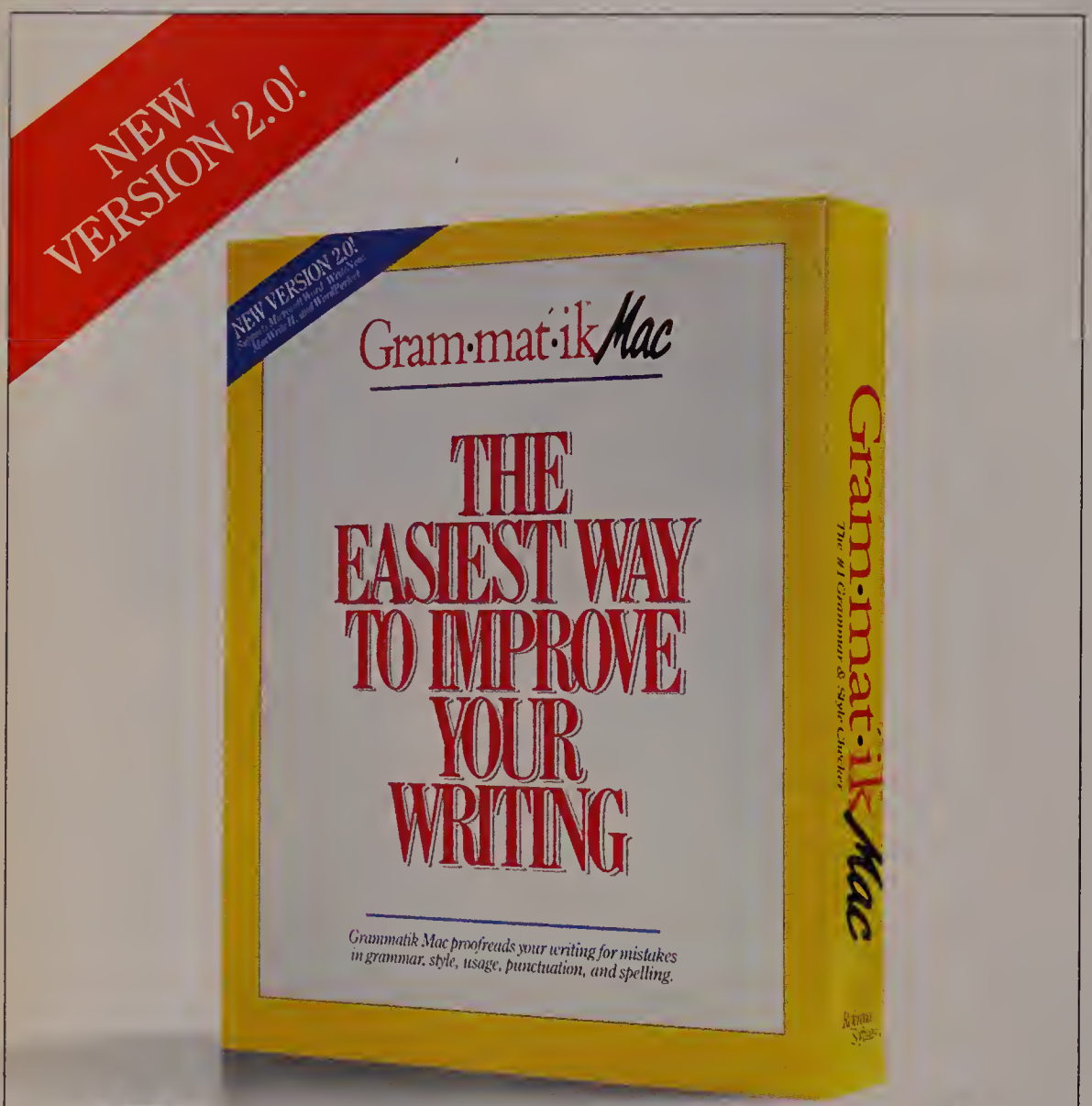

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Taking to the Air

ROMs or no ROMs, Outbound has critics who think that the computer doesn't offer much. "I'm really skeptical about the whole product," says consultant Richard Schaefer of Technologic. Detractors cite reliability questions (some early problems, which Outbound claims have been corrected, have tarred the computer's reputation); a less-than-crisp screen display; a built-in lack of power due to its reliance on the chips from Apple's least powerful and now obsolete computers; and a confounding replacement for the mouse, a finger-controlled device called the Isopoint. (Craig Culver, who invented the Isopoint, charges that Outbound has poorly implemented his creation.)

Strangely, some of the criticism comes from Apple Computer, cosigner of the mysterious agreement. Apple's director of worldwide CPU marketing, Brody Keast, says, "It's an interesting product, but not right for Apple or its customers. The battery life is under three hours. The Isopoint is not right for most people. You can't have a model with both a floppy and a hard disk drive. The display is not that good. The weight is heavier than you'd like to see on a laptop. And when you calculate the cost of a complete system, the price is only a few hundred dollars less than our portable."

My own assessment is not as harsh. I've been testing the Outbound for some time, and I'm moderately impressed. Not that it's been all roses. At around ten pounds, the computer is more leaden than most laptops. The display is all too often haunted by smeary ghosts of pixels past. It did take me a while before I finally reached the point where my Isopoint skills could be rated as adequate (things got a lot better when Outbound released a new version of its software, though according to Culver, the Outbound Isopoint is still "not OK—mechanically it's got problems"). And the lobotomized Mac that accompanied my Outbound had no trouble finding its way to the closet. Yet I found the Outbound to be sufficiently useful to justify its presence on short business trips—in fact, it's the only decent alternative available to me as someone who wants to run Macintosh software in any airplane without the desk space of Air Force One.

Even more encouraging was the fact that during the few months I've had the Outbound, the company made some necessary improvements. Outbound's smartest move was the addition of a cable that allows you to perform the novel task of getting information in and out of the computer. (Outbound charges $149 for this SCSI adapter, but this "option" should be provided as standard equipment.) Another vital accessory was a new compact external floppy disk drive.

I don't want to sugarcoat the issue—there are still problems. Chief among them is the limited battery life

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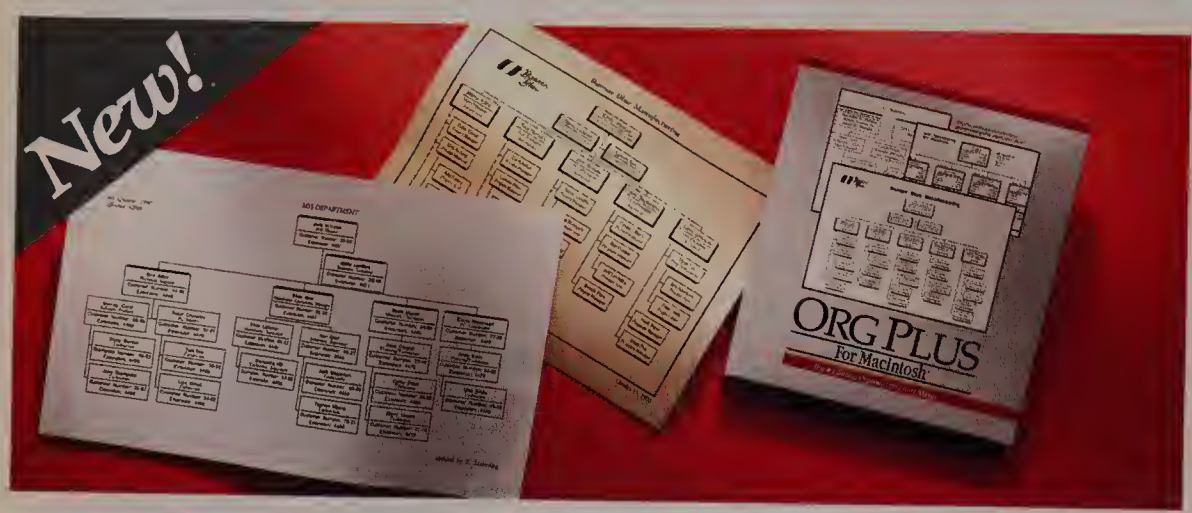

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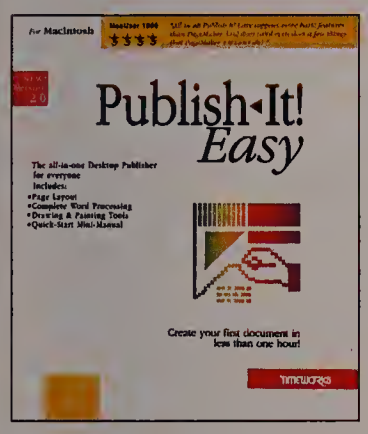

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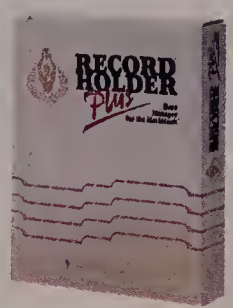

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and the compounding problem that unless you keep the machine continually recharged, you may lose information on the so-called silicon disk. In fact, even when using the power cord, the general performance of a battery-low Outbound gets pretty dippy, with confusing error screens popping up. But overall, I can live with an Outbound. Moreover, I would like to see it evolve from a decent laptop to a fine product.

Lapped by the Competition

Unfortunately, I'm not sure whether Outbound will have the opportunity to grow and thrive. The company's future depends largely on what is in that secret agreement with Apple—an agreement that Outbound could not live without, since it stilled the constant threat of a lawsuit from, as Robert Louthan puts it, "Big Brother." As one might expect, the pact's secrecy has generated a caldron of rumors about what Outbound gave up to Apple. Many industry observers assume that Apple, in exchange for some amount of cash and a promise not to unleash its attack lawyers on the nascent company, purchased Outbound's assets, notably its technology. Indeed, one former Outbound employee assured me that Apple now owned Outbound's technology, leasing it back to the company for a period of under three years. The principals would not comment, of course, but if that is an accurate characterization, Outbound's future depends on Apple's whim. In any case, since we don't know, we cannot rule out the worst. While Outbound seems to think secrecy suits its purposes, its potential customers may not want to deal with a company that proudly unfurls a pact and then refuses to divulge its implications.

But whether or not Apple does control Outbound's technology, the agreement demonstrates one thing above anything else: Apple controls the marketplace for anything that follows the Macintosh standard. Make no mistake about it—Apple's interests were not in emulating the Outbound but in maintaining an ironclad grip on the Mac standard. "Outbound has no particular technology that we want," says Brody Keast, confirming that the importance of the agreement was precedent—anyone else trying a similar laptop scheme will be operating under the specter of copyright infringement.

But when I asked Keast about Apple's refusal to license its ROMs to Outbound, or at least to allow its customers to purchase ROMs directly, Keast provided a surprising response. It was not so much the principle that stopped Apple from considering options like that, but the fact that Outbound's computer was not up to Apple snuff. Keast confirmed that for a superior product, Apple might have been willing to deal.

Come on now, Brody—does Apple Computer really expect a leading-edge company to devote brilliant engineering skills and millions of dollars to develop a computer whose fate depends entirely upon Apple's willingness to let it live? Given Apple's aggressive stance toward protecting its property rights, it is remarkable that we have anything as good as the Outbound available in the marketplace. In the MS-DOS world—that huge universe that Apple presumably is trying to compete with—there are myriad choices of laptop and portable computers, dazzling models that make the Outbound and Apple's portable look sick. That is not simply because the task of creating a Mac laptop is more difficult—it's because Apple has closed off the marketplace.

One day, I am sure, Apple will keep its publicly stated promise to develop a line of portable computers that address varied customer needs, much in the same way that Apple provides a choice of desktop models. These may, or they may not, be developed in tandem with outside firms. (Rumors abound that Sony or Toshiba might be among them.) But Apple needs market share now, and we need competitive Macintosh laptops now. Instead of playing games with Outbound's future, Apple should tend to its own—and play some serious catch-up with the rest of the world. ■

Steven Levy, a Macworld *columnist, is currently writing a book on artificial life.*

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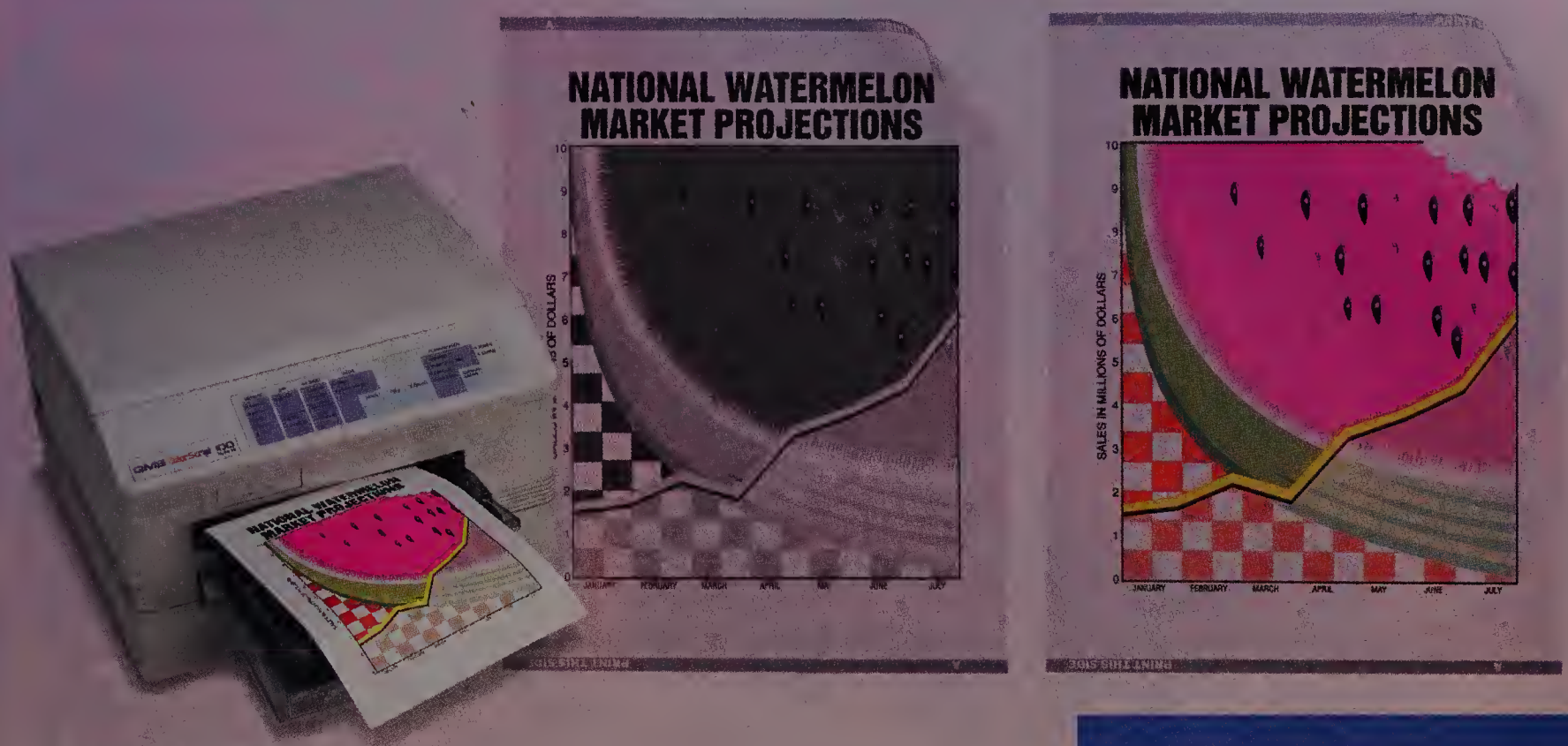

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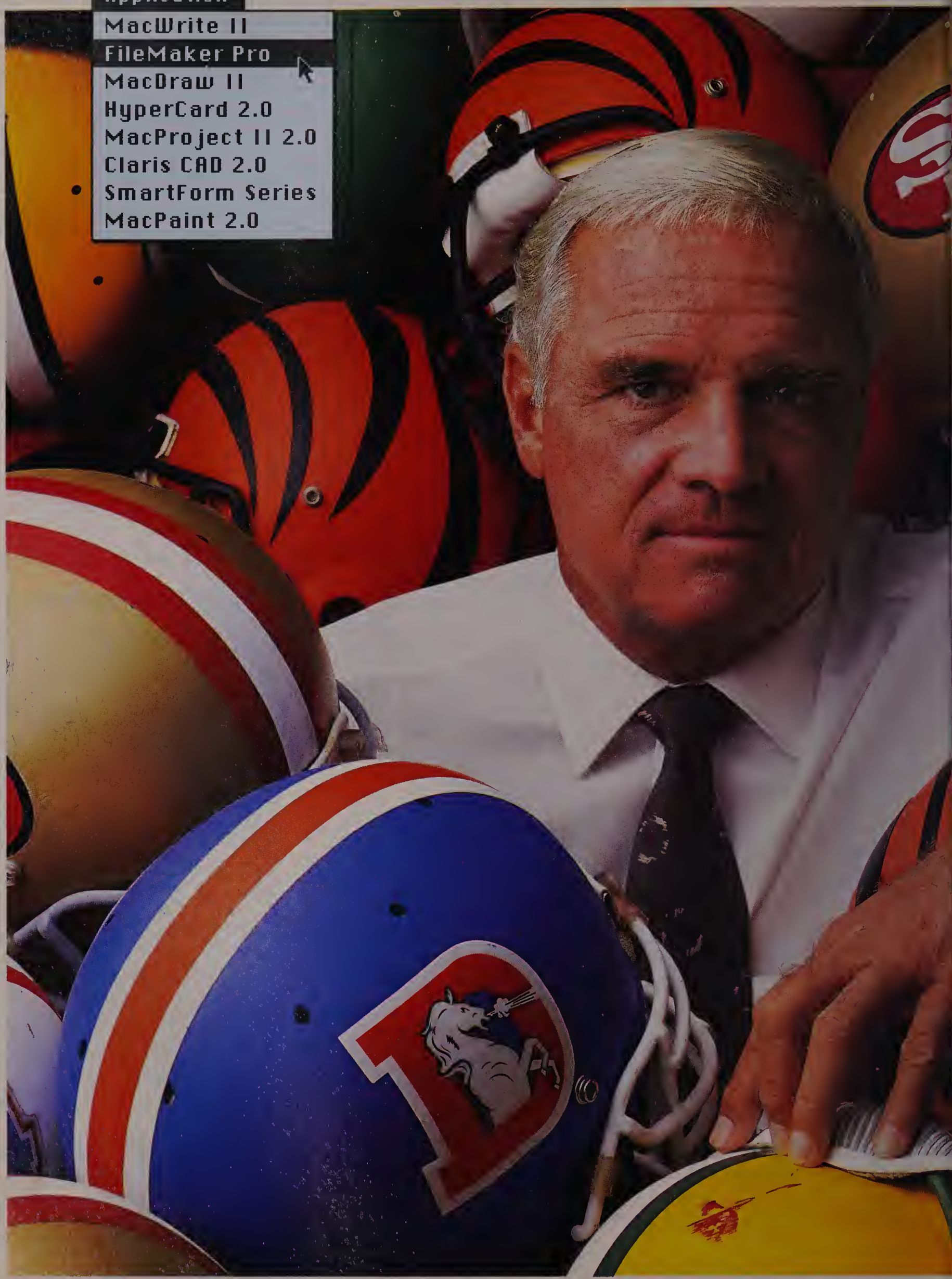
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Buyer Beware

RADIATION FINDS ITS NICHE AS A MARKETING TOOL

BY DEBORAH BRANSCUM

The Champ Polar Filter sounds like a winner. According to the product information sheet available last October, the Champ is "EPA tested and verified to reduce the Electro-Magnetic Radiation by 67%." The screen "eliminates eyestrain and headaches" and "reduces potential harmful effects of continued computer use." On the back of the flier are brief descriptions of articles about computer health concerns. "Don't Be Fooled!" warns a little box at the bottom of the page. "Radiation screens must be CERTIFIED. Many 'glare' screens on the market do not protect against radiation. The Champ is certified by the EPA."

Despite the impression given by the product sheet, the Champ is not approved by the Environmental Protection Agency. The screen does not block 67 percent of all electromagnetic emissions, and specifically not the low-frequency magnetic ones that concern some scientists. The product may well block x-radiation as a testing certificate states, but it's not clear that computer monitors generate a hazardous amount of X rays.

Many safety products are being peddled to a newly fearful population of computer users. Buoyed by publicity about health issues in *Macworld* and other publications, some manufacturers are using confusing or inaccurate statements to sell their wares.

One such company is the Phoenix, Arizona–based Committee Against Radiation, Inc., which manufactures the Champ Polar Filter. The chairman of the company, Christian M. Banes, will not agree with this assessment. A dapper fellow of 68 who looks much younger than his age, Banes defended his company and its literature during a lengthy interview in Phoenix in late October. Banes told me his company plans to delete references to the EPA in its material, and the Champ's San Diego distributor confirmed that it had stopped telling customers about EPA certification several months before.

WIDE WORLD PHOTOS

Committee Against Radiation, Inc. chairman Christian M. Banes

That ought to be the end of the story—a simple misunderstanding that is now resolved. But the reality is more complex. In Phoenix I discovered that Chris Banes is a courtly, entertaining, opinionated guy who is selling a product in an area he doesn't understand. He's willing to make claims about his product but unwilling to take responsibility for them. "I do not make any claims about this screen whatsoever," said Banes. "Never have. I simply say what other people have said that I consider to be good things about it." But unlike Banes, I believe that if a company repeats claims about a product, it ought to be able to prove them.

Early on, the Champ was sold primarily on its optic qualities, but that changed after November 1989. That month Seth C. Hunt, retired from his job as deputy regional administrator in the EPA's Denver office, sent a letter to Advance Computer Education, now the San Diego distributor of the Champ. The missive said, in part, "I was advised by

(continues)

members of EPA's professional staff that perhaps the major concern facing America in terms of constant use of VDTs is exposure to the electromagnetic current being emitted from the terminals. It's the magnetic current which can cause cell damage to the user. With this knowledge and concern, I asked the Regional EPA Chief of the Radiation Programs to test the Champ Polarfilter Shield that I had acquired from you. Now the good news: . . . Their tests showed the magnetic field was reduced from between 5 and 6 milligauss to as low as 2 milligauss when the shield was placed on the VDT . . . Congratulations for your achievements in helping to protect the health and safety of American workers." Hunt included a copy of the EPA test results with his letter.

No one can blame the company for wanting to take advantage of such news. (In fact, Hunt was so impressed that he became a Champ distributor.) Unfortunately, the letter was based on a flawed test, according to the EPA, and the company apparently didn't have the technical sophistication to recognize that. "The test results were incorrect," said Milton Lammering, the regional EPA officer who made the test measurements. "I made a mistake. Period." And Lammering said the product was never EPA certified—the EPA never endorses products.

Nearly a year later, the EPA asked the Committee Against Radiation to stop mentioning the agency in its material. Banes agreed but bridles at the notion he might have misled consumers by using the phrase *EPA certified.* "We have never suggested the EPA endorses the product," said Banes, a self-described former wonder boy of Madison Avenue as a copywriter. "Webster's dictionary says that a certification is another way of saying that you have received a letter as to the results of any tests. . . . The word *certified* was not used with any malice, nor was it meant to mislead. . . . What we have done is not deceptive because I've simply reported what a government agency has said."

Although Banes is willing to drop the EPA reference, he's not really convinced the agency's test results were flawed. Political pressure, he suggests, is forcing the EPA to backtrack. According to Banes, Lammering "has been instructed by the bureaucrats in Washington that the EPA is no longer in the radiation business and that he is to recant the test. Actually, they wanted him to say that he never did the test. And he refused to say that."

The official in question, who has never spoken to Banes, disagrees. "I have had absolutely no political pressure," Lammering said. "I made a mistake in measurement and I'm trying to clear it up. It's got nothing to do with political pressures at all."

At this point, a reminder is in order: extremely-low-frequency (ELF) magnetic fields go through just about everything, including the Champ filter. It's not a moot point, since until recently a fair chunk of Champ literature was devoted to the menace of electromagnetic fields. Unfortunately, according to our test, the Champ has no effect whatsoever on magnetic fields and blocks only 17 percent of the very-low-frequency electric field.

Even so, Mr. Banes seemed unconcerned that the Champ, like other screens, failed the *Macworld* test. "My position, whether it is considered correct or incorrect by other people, is simply that a government agency tested this screen and I have the re-

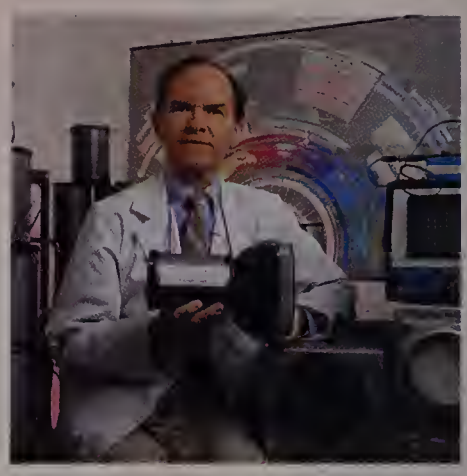
(continues)

GOOD NEWS, BAD NEWS

Although several companies imply that their products block extremely-low-frequency (ELF) electromagnetic emissions and thus magnetic fields, I've found only one that actually does the trick. E.L.F. Armor (formerly Bioshield) from Fairfield Engineering (515/472-5551) is a special steel-alloy cylinder that fits over the neck of a cathode-ray tube to reduce emissions. The product is available only for compact Macs; other versions are expected.

Macworld Lab tested the $79.95 product, which must be installed by the company or an Apple-certified technician, using a Mac Plus and a Holaday Industries HI-3600 VDT Radiation Survey Meter. Measuring from the front of the display at a distance of 4 inches, the magnetic field was reduced from 6.4mG to 4.5mG. From 12 inches, the field was reduced from 2.6mG to 0.59mG. And from 28 inches, the field was reduced from 0.36mG to 0.14mG. Magnetic emissions at the sides and back of the monitor were also reduced; electric fields were not significantly affected.

The good news is that E.L.F. Armor significantly reduces ELF magnetic fields. The bad news is that such a reduction may not be enough to affect any health risk that may exist. As yet there is no scientific consensus about ELF field exposure—no one can say what level, if any, is hazardous.



MARK PAUL PETRICK

Fairfield Engineering founder George Reid

It's important to note that the officials I've spoken to at the Environmental Protection Agency and the Occupational Safety and Health Administration suggest that any health risk from your monitor, if one exists, is small. Users who sit in front of their Macs chain-smoking and worrying about ELF emissions are overlooking a much more dangerous activity than computing.

While scientists debate the ELF issue, I'm happy to report that the industry is pushing ahead to reduce emissions. Sigma Designs, Qume, CalComp, and Nanao are shipping monitors that meet Swedish standards for very-low-frequency magnetic emissions. One industry insider told me that it will be a market necessity for monitor makers to meet upcoming Swedish specification for ELF emissions as well.

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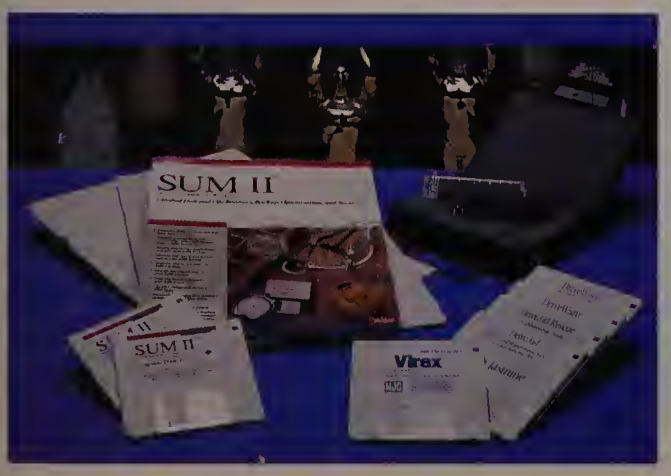

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Circle 126 on reader service card

sults of that test on their stationery signed by their top person at that time, witnessed by two other people who have voluntarily, after their retirement, given me corroborating information," said Banes. "I can take two positions. I can say the EPA hasn't the slightest idea what they're doing. Or, for selfish reasons, I can choose to believe the EPA. And I choose to believe the EPA because I have no knowledge or expertise that would allow me, even remotely, to disagree with a scientist."

And that, perhaps, is the crux of the matter. It doesn't seem unreasonable to expect that the chairman of a company named Committee Against Radiation should be educated about the different types of radiation and understand why the EPA was wrong when it claimed the Champ filtered out magnetic fields. (It's a mistake for Banes to rely on Seth Hunt's expertise in evaluating the issue. As the genial former EPA employee told me, "I'm not a scientist, I came up through the management ranks.") At one point Banes said, "I don't know what a milligauss is, nor do I ever intend to find out, because I don't care." When I suggested that he was trying to capitalize on the press and the fears that people have to sell a product, he said, "You say I'm trying to capitalize. I might be trying to educate. That's a possibility. There's a possibility that I'm a really nice person and that I'm trying to do good for people."

That's entirely possible. It's also possible that Mr. Banes is more interested in winning new distributors than in educating consumers, since new Champ distributors are required to invest close to $30,000 for initial inventory. Mr. Banes strikes me as a caring but misguided man who's tried to make the cash register ring by telling people that his product will "knock out computer radiation." But that claim is only partly true.

Dr. Richard J. Glonek of Phoenix is one of two optometrists who have endorsed the Champ. He likes the screen's ability to block ultraviolet rays and "the added benefit of blocking electromagnetic emissions." And he said he advised all his pregnant patients not to work on computers.

I asked Dr. Glonek if he felt better about his pregnant patients working in front of a computer with a Champ filter. His answer was yes—until I broke the news that the Champ was virtually useless for blocking electromagnetic fields. "I was reluctant in the beginning to endorse anything," said Dr. Glonek. "I knew the optical qualities and polarization were there, so I was very comfortable about that. But as far as the electromagnetic emissions, I was relying on the EPA results and the materials [the company] gave me."

There are some promising product developments (see "Good News, Bad News"), but there's also a lot of hype. The Committee Against Radiation hasn't been alone in using the fear of radiation as a marketing tool.

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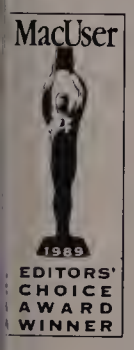

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Circle 45 on reader service card

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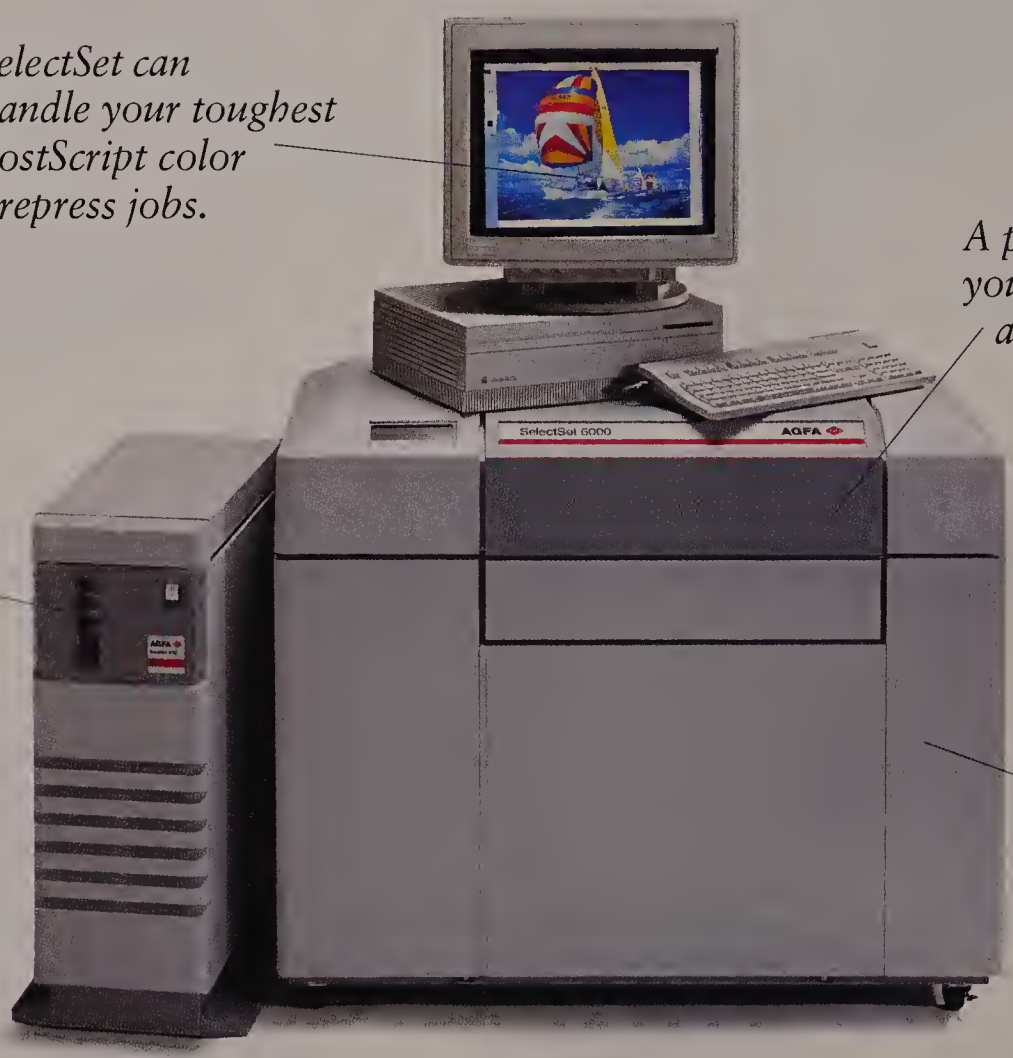

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One example is the Maxi-Lite video-display safety apron. The gentleman who designed the predominantly lead apron, A. D. Carroll, sent out a press release that states the product guards against X rays and "includes the addition of a protective layer of aluminum material to guard against extremely low frequencies."

I called Carroll to ask if that meant the product blocked electric fields *and* magnetic fields. He said it did both. According to *Macworld* tests, that's not true. The Maxi-Lite apron did block up to 71 percent of the electric field, but had no significant effect on the magnetic field.

Carroll, however, said he believes his product blocks magnetic fields, but he can offer no evidence. "What you're looking for, you're not going to find," Carroll told me. "There's no proof. This is a new field. There is not a means to test these things properly."

Carroll, like Christian Banes, seems to have a good heart. But a good heart doesn't guarantee good engineering. And pregnant women concerned about X rays shouldn't be lulled into thinking the 5.25-pound Maxi-Lite apron also protects them from magnetic emissions.

(Pregnant women should check with their doctors before buying a lead apron–type product. According to the Canadian Centre for Occupational Health and Safety, the use of lead aprons is "inappropriate and possibly hazardous to the health and safety of operators of VDT equipment.")

It's not only small companies that make confusing or potentially misleading claims. Polaroid is marketing a glare filter that reportedly "fights VLF/ELF radiation and static." But Polaroid is referring to electric fields, not magnetic fields. A company official said new literature would make a distinction. (To its credit, Kensington Microware dropped an advertisement for an antiglare filter that appeared in *Macworld* after we complained about similar wording.)

It's not easy to know what companies mean when they sell radiation shields. Many screens that claim to block electromagnetic emissions, like the Polaroid product, block virtually all of the electric field, but do not affect the magnetic field at all. Some, like the Champ, claim to reduce both X rays and electromagnetic emissions but significantly reduce only X rays.

But X rays may not be the problem. According to U.S., Canadian, and Swedish government officials, monitors generally emit X rays at close to a background level. The Radius Two Page Display, for example, was tested at .05 millirems per hour; the government standard is ten times higher. But as author Bob DeMatteo writes in *Terminal Shock* (NC Press Limited, 1985), "Today we know that X ray damage is cumulative and that any exposure, however slight, entails risk." So users must decide if an additional precaution against X rays is necessary. (When buying a monitor, look for the

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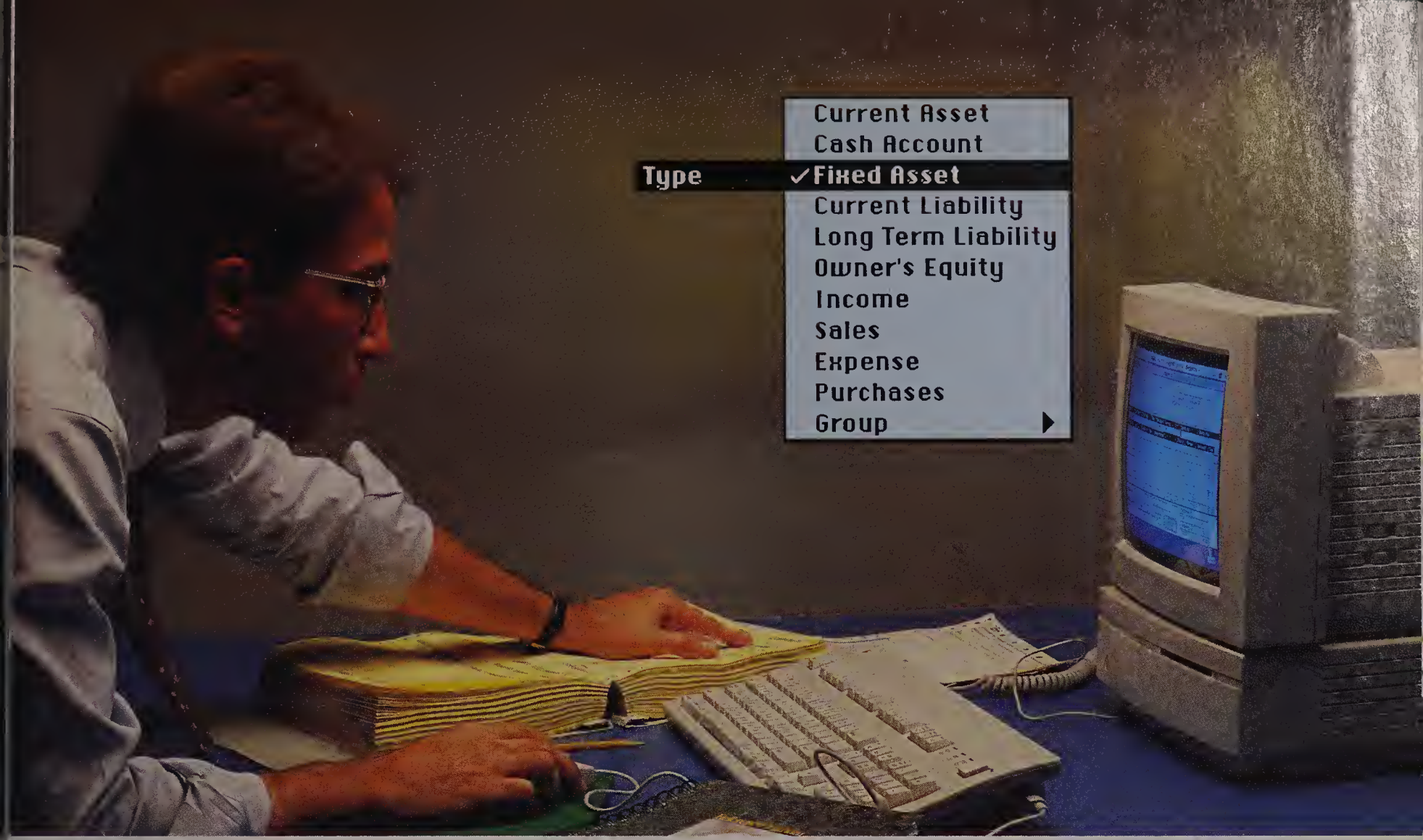
Circle 220 on reader service card



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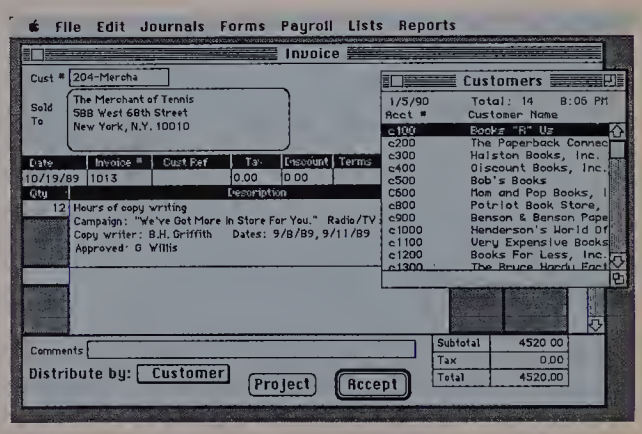

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Circle 367 on reader service card

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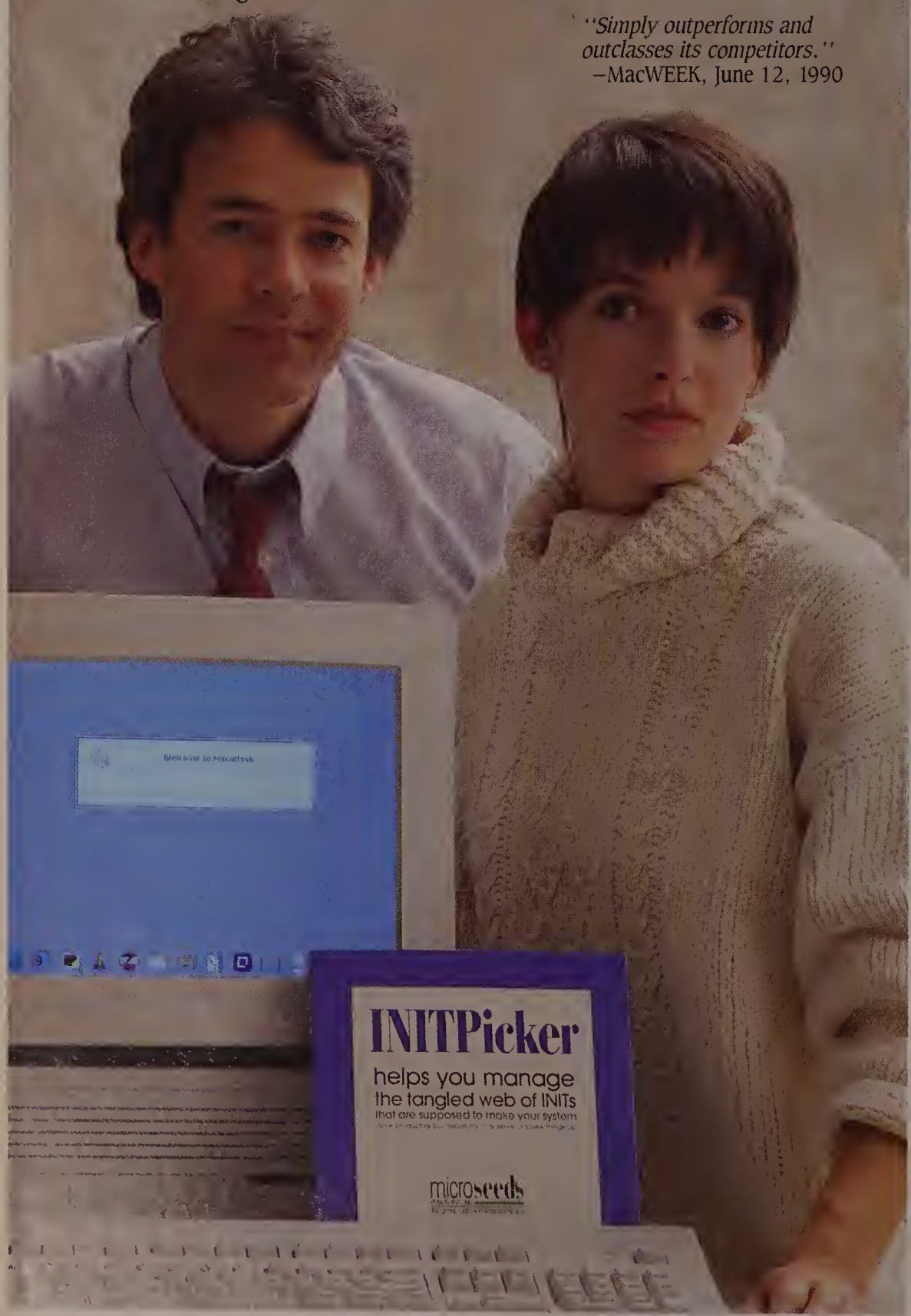

Circle 228 on reader service card

SERVICE HERO

Ronald L. Blake of Jackson, Tennessee, ordered 70ns RAM from Technology Works but received 80ns RAM instead. A replacement memory board was shipped, but Blake never received it. Although the shipping company claimed the product had been delivered, Blake still didn't have the correct board. Another replacement was sent overnight, and Blake was instructed to use the Technology Works account to ship back the original memory board at no cost, much to his delight.

following on the back: "This product complies with DHHS Rules 21 CFR Subchapter J applicable at date of manufacture." That means a production model was tested and met the government standard.)

As we went to press, Christian Banes called to say that because of this article, he was rethinking the way he sells the Champ screen and is writing new literature. "If the filter does not perform as the EPA said it performs, then we have been misled by the government . . . and we will take steps to correct that," he said. "It is too easy to make money to be involved in making money by misleading someone."

Banes deserves credit for considering the issues I've raised, and I hope Committee Against Radiation changes its literature accordingly, as Banes said it will. And I hope the industry as a whole changes its marketing approach to the radiation issue by becoming knowledgeable, honest, and clear about the limitations of such products.

But don't hold your breath. ■

(Research assistance by Loren Stein.)

Send nominees for sainthood to Service Heroes, Macworld, *501 Second St., San Francisco, CA 94107 or via AppleLink (Macworld1) or Connect (Branscum). Conversely, drop* Conspicuous Consumer *a line if a company is ignoring you.*

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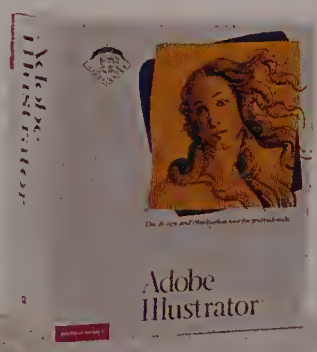

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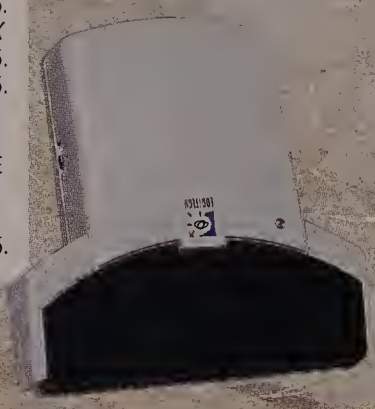

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Mindscape Inc. Dollars & Sense 5.0

Dollars and Sense has been a leading Macintosh program since 1984 because it eliminates drudgery. Your computer can generate checks, automatically record income and expenses, help balance your checkbook, and produce great-looking financial statements. At tax time your data will automatically beready to prepare a return or to export to a tax programlike Macintax.

Dollars & Sense 5.0 ..... $60

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Fuji Disks
DS/DD 10 pk Rainbow ..... 12.
DS/DD 10 pk ..... 11.
HD 10pk ..... 20.
HD Rainbow 10pk ..... 21.

Sony Disks
DS 10pk ..... 13.
Bulk DS/DD (50 pk) ..... 39.
HD (1.44 mb)10pk ..... 22.
Bulk HD (50 pk) ..... 90.

Modems & Fax

Abaton
InterFax 12/48 ..... 261.
InterFax 24/96 ..... 417.
InterFax 24/96-220V ..... 417.

Applied Engineering
2400 MNP 5 Ext. ..... 195.
2400 MNP 5 Int. ..... 250.
2400 MNP 5 Send FAX Ext. 225.
2400 MNP 5 Send FAX Int 275.
2400 MNP5 Send FAX Port 205.

CompuServe
Membership Kit ..... 22.

CompuServe
Navigator 3.0 ..... 48.

Dove
DoveFax 24/96 ..... 278.
DoveFax Plus ..... 395.

Everex
EMAC MD2400 MNP 5 ..... 175.

FreeSoft
Second Sight ..... 85.
White Knight 11 ..... 84.

Hayes
Smartcom II 3.1 ..... 84.

Microcom
MacModem v.32 MNP 9 ... 675.

Orchid Technology
Orchid Fax Modem ..... 435.

Preferred Publishers
Double Talk twin pack ..... 115.

Prometheus
Modems come with cables & Macknowledge
Macknowledge ..... 84.
MacFax 24/96 ..... 295.
MacFax 9600 ..... 750.
FAX Modem Portable Int. . 204.

ProModem
2400 Mini ..... 138.
2400 SE Int.(MNP5) ..... 245.
2400 II Int.(MNP5) ..... 259.
9600 V.32 ..... 750.

Shiva Corporation
NetModem V2400 ..... 410.
NetModem 9600V.32 .... 1,375.

Software Ventures
Microphone II 3.0 ..... 214.

Solutions
BackFax ..... 138.

Solutions
FAX Gate Plus 1.1 ..... 238.
MailMaker 5 User Pack ..... 116.

Supra Corp.
Supra 2400 ..... 118.
Supra 2400 MacPac ..... 178.

Synergy Software
Versa Term 4.1 ..... 87.
Versa Term Pro 3.0 ..... 173.

Telebit
T-2500 V.42 Rel 6.01 .... 1,050.

U.S. Robotics
Courier HST 9600 Std. ..... 675.

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Programming

Borland International
Turbo Pascal 1.1 ..... 67.
Turbo Pascal Tutor 1.0 ..... 46.

Digitalk
SmallTalk/VMAC ..... 124.

Mainstay
V.I.P. ..... 85.

Microsoft
Quick BASIC 1.0 ..... 64.

Paragon Courseware
QUED-M ..... 85.

Serius
Developer ..... 329.
Programmer ..... 210.

Serius
Animation Object & Communications Objectea. 64.

Symantec
Just Enough Pascal ..... 49.
Think Pascal 3.0 ..... 160.
Think C 4.0 ..... 162.

TGS Systems
Prograph w/ Compiler 2.0 238.

True BASIC, Inc.
True BASIC Language 2.02 52.

Zedcor
ZBasic ..... 98.

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Asante
MacCon+II E & IIET ..... 340.
MacCon+II E ET 64Kb ..... 375.
MacCon SE E & ET ..... 275.
MacCon SE/30 E & ET ..... 340.
MacCon SE/30 64Kb ..... 375.

Cayman Systems
Gator Box ..... 1,955.
Gator Share Software .... 1,350.
Gator Card E/II ..... ea. 458.
Gator Mail Q (10 user) ..... 675.
Gator Mail Q (up to 200) ... Call.
Gator Mail M (10 user) ..... 675.
Gator Mail M (up to 200) .. Call.

CE Software
In/Out (1-5 user) ..... 127.
In/Out (1-10 user) ..... 186.
QuickMail 2.2
1-5 users ..... 207.
1-10 users ..... 307.
1-50 users ..... 1,567.

DataViz
MacLink Plus PC 4.5 ..... 116.

DataViz
MacLink Translators ..... 97.

Dayna Communications
EtherPrint ..... 350.
DaynaPort E/SE,II & 030 .. 355.
DaynaNET/4L ..... 565.
8L ..... 1,275.
XL ..... 2,560.
8LE ..... 1,560.
XLE ..... 2,840.
Speed guard collision filter . 52.
DaynaTalk for Macintosh
Single ..... 95.
5 Pack ..... 380.
10 Pack ..... 715.

DayStar Digital
Local Talk Board
LT 200 MC ..... 295.
LT 200 PC ..... 185.

Dove
Ethernet
FastNet SE, SE/30 or
FastNet III ..... 340.

Farallon
LocalTalk -
PhoneNET DIN-8 ..... 30.
PhoneNET DIN-8 (10 Pk) . 195.
PhoneNET DB-9 ..... 30.
Star Connector (single) ..... 17.
Star Connector (10 Pk) .... 125.
Star Controller 300 ..... 819.
Repeater ..... 309.
PhoneNet/AppleTalk Adapt. . 8.
Ethernet - PhoneNET cards include Timbuktu & RJ45 cable
PhoneNET EN Mac II ..... .350.
Mac II Card (10 Pk) ..... 3,375.
PhoneNET EN SE/30 ..... 350.
SE/30 Card (10 Pk) ..... 3,375.
Star Connector EN ..... 120.
Star Controller EN ..... 1,588.
Star Wiring Kits-
Star Controller LT/EN ..... 62.
Passive Star ..... 62.

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DigiVideo Color ..... 639.
MicroTV ..... 250.

Digital Vision
Computer Eyes-Color ..... 348.
Computer Eyes-B/W ..... 194.

Farallon
Media Tracks ..... 188.
Multimedia Pack ..... 318.
Mac Recorder 2.0 ..... 158.

Farallon
Voice Digitizer ..... 109.

MacroMind
MacroMind Accelerator .... 124.
MacroMind Director 2.0 ... 437.
MacroMind Director 3D .... Call.

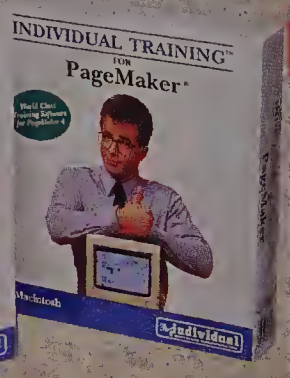
Orange Micro
Personal Vision ..... 1,383.
OMI Convertor ..... 615.

RasterOps
Video Expander ..... 525.

Individual's Software Professor Mac

Now, there is a perfect way to learn how to use the Macintosh and it's as easy to use as a click of the mouse. Professor Mac lets the beginner or intermediate Mac user pick up speed on Macintosh skills from manipulating text to understanding how the Macintosh system operates. Its self-paced design puts you in control of how quickly you advance

Professor Mac $38
Training for PageMaker 4.0 .. $34



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Design Your Own Home Architecture, Interiors & Landscape ..... ea. 60.

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Vellum ..... 684.

Claris
Claris Cad 2.0 ..... 624.
MacDraw II ..... 288.

Generic Software
CADD for the Macintosh ... 374.
Generic CADD Level 1 ..... 83.

Generic Software
Libraries for Generic CADD available on request ..... Call.

Graphsoft
Blueprint ..... 218.
MiniCad+ 3.0 ..... 585.

Innovative Data Design
Dreams ..... 318.
Mac Draft 2.0 ..... 192.

Softstream International
Relational Objects ..... 148.

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Use Informed Designer to automate and computerize your routine office paperwork. Shana has made it easy to produce professional quality custom forms in just minutes! Data can be printed onto custom stock, or the entire form (including data) can be output together. With the Informed Mini-Manager (sold separately) you can fill out and organize the forms on your Mac!

Shana Informed Designer $158
Informed Mini Manager $53

HYPERWARE & CD's

Activision
Cosmic Osmo CD ROM ..... 45.
Manhole CD ROM ..... 33.

Addison Wesley
Hypercard Script Language Guide ..... 18.

DataDesk
Hyper Dialer ..... 30.

Farallon
Media Tracks CD ..... 318.

Hyperpress Publishing
Script Library ..... 56.

Hyperpress Publishing
Script Expert ..... 44.
ICON Factory ..... 44.

Icom Simulations
Hyper TMON 2.8.4 ..... 57.

Individual Software
Individual Power Macros for Hypercard ..... 34.

MacroMind
Materials CD ROM ..... 124.

Microsoft
Office CD ROM ..... 598.

Silicon Beach Software
Super Card 1.5 ..... 198.

Softstream International INC
Hyper Hit I ..... 118.
Hyper Hit II Relational ..... 268.

Wayzata Technologies
Quickart ..... 174.
Seals in the US Gov't ..... 49.
All of Mac Tutor ..... 160.
Disc Tracy ..... 75.
The USA Factbook ..... 75.
The CIA Factbook ..... 80.
Baseball Guide & Register . 138.
Vietnam Remembered ..... 69.
GEM- Public Domain ..... 75.

ACCESSORIES

Avery Labels
Mac Label Pro ..... 48.

Casio
Casio B.O.S.S. ..... 219.
CasioLink/Mac ..... 98.

CoStar
LabelWriter ..... 184.
Organizer ..... 195.
Organizer Jr. ..... 68.

I/O Designs
MacLuggage - Carrying Cases
Imagewriter II. ..... 48.
Mac Plus ..... 64.
Mac SE ..... 78.
Mac II ..... 98.
Mac IICX ..... 84.
The Ultimate SE Case ..... 78.
Neon Ultimate Carrying Case Green - Pink - Yellow ..... 88.

Kensington Microware
Dust Cover SE XKB ..... 9.

Kensington Microware
Dust Cover SE. ..... 9.
ImageWriter II Cover ..... 8.
Anti-glare Filter ..... 32.
SE Rad./Anti-Glare Filter .... 51.
Anti-glare Filter 13" Apple ... 63.
System Saver ..... 63.
System Saver SE ..... 52.
Universal Printer Stand ..... 15.
Mac II Stand w/o cable ..... 19.
Mac IIcx Monitor Stand ..... 54.
Mac II Monitor Stand ..... 64.
Mac II Mon. Cable Ext. Kit ... 32.
Masterpiece Mac II ..... 105.
Extended ADB Cable ..... 24.
Universal Copy Stand ..... 22.
Printer Muffler 80 ..... 43.
Power Tree 10 ..... 19.
Power Tree 20 ..... 27.
Power Tree 50 ..... 54.
Apple Security Kit ..... 34.
LaserWriter II Security Kit .. 32.

Kensington Microware
A-B Box (DIN-8) ..... 63.
SuperBase ..... 31.
PowerBacker 360 ..... 269.
PowerBacker 450 ..... 337.
PowerBacker 520 ..... 397.
PowerBacker 800 ..... 746.
PowerBacker 1200 ..... 946.
Pass Proof ..... 70.
SideClip ..... 6.

Mac Packs - Linebacker
Navy, Wine or Gray
ImageWriter Bag ..... 45.
Mac Plus/SE Bag ..... 55.
Mac SE Bag Xt ..... 69.

Smack-a-Mac
Smack-a-Mac Stuffed Mac ... 8.
Covers
SE/Plus w/ext. keyboard .... 17.
SE/Plus w/std. keyboard .... 17.
Apple 13" monitor & ext. keyboard ..... 18.

MUSIC

Ars Nova
Practica Musica ..... 68.

Bogas Productions
Super Studio Session 2.0 ... 64.

Broderbund
Jam Session ..... 28.

Coda
Finale 2.0.1 ..... 557.
Mac Drums ..... 30.
MusicProse ..... 186.
Perceive ..... 49.

Electronic Arts
Deluxe Music Const. Set .... 82.

Great Wave Software
Concertware + MIDI 5.0 ..... 97.

Mark of The Unicorn
Professional Composer .... 375.

Mark of The Unicorn
Professional Performer .... 375.

Passport Designs
MasterTracks Pro 4.0 ..... 315.
MIDI Interface ..... 75.
Note Writer II ..... 295.
Sound Exciter ..... 48.

PG Music
Band in a Box ..... 57.

Tactic Software
Sound Clips 1 - 4 ..... ea. 45.

The Mac Zone
Established 1986

Ultra buys on umpteen useful utilities

The Mac Zone
Established 1986

Fifth Generation Software Family

Here's a great line-up of utilities software, only from Fifth Generation! Look at the selection. Suitcase II expands your font and desk accessory menus, giving you access to as many as 255 items in each. Pyro belongs on every Mac to prevent screen damage. Super Spool 5.0 saves print files to disk so you can get back to work while the ImageWriter grinds away. Plus, DiskLock provides passwork protection for the data files on your hard drive. And don't forget super values on FastBack II, PowerStation 2.5 and SuperLaserSpool 2.02.

Disk Lock 2.0 ..... 117.
Fast Back II ..... 117.
PowerStation 2.5 ..... 33.
Pyro! 4.0 ..... 24.
Suitcase II ..... 48.
SuperSpool 5.0 ..... 57.

SuperLaserSpool 2.02
Single User ..... 85.
5 pack ..... 288.

UTILITIES

Dantz Software

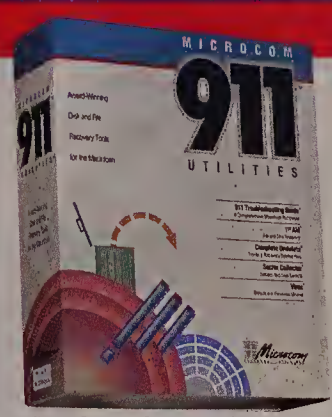
With Retrospect, you can remove seldom-needed files to permanent storage, and free up space on your hard disk. It works with almost any media, from floppys to rewriteable optical discs. Retrospect maintains a catalog on your hard disk so you always know where to look to find archives or backup files.

Retrospect $143
Retrospect Remote $264

Abbott Systems
Canopener 1.1 ..... 62.
Aladdin Systems
Shortcut ..... 39.
Stuffit Deluxe ..... 62.
ALSoft
DiskExpress II ..... 53.
Master Juggler ..... 63.
ASD Software
Fileguard ..... 138.
Baseline Publishing
Talking Moose ..... 24.
Mac Cheese ..... 58.
APB Express ..... 59.

Beagle Bros Inc.
FLASH ..... 126.
Berkeley System Design
After Dark ..... 22.
Stepping Out II 2.02 ..... 48.
Casady & Greene
QuickDEX ..... 33.
CE Software
MockPackage Plus ..... 30.
QuicKeys 2 ..... 93.
DiskTop 4.0 w/GOfer ..... 62.
Central Point Software
Copy II Mac 7.2 ..... 25.
Mac Tools Deluxe ..... 75.

Custom Applications Inc
Freedom of Press 3.0 ..... 252.
Light ..... 55.
Dariana Technology
Mac Sleuth ..... 85.
Dubl-Click Software
Clickchange ..... 39.
Hyperpress Publishing
Step Ahead ..... 56.
ICOM Simulations
On Cue 1.3 ..... 34.
Insight Development
MacPrint 1.2 ..... 88.
Kiwi Software
Kiwi Finder Extender ..... 64.
Magic Software
AutoSave II ..... 23.
BackMatic ..... 47.
Mainstay
Marco Polo ..... 151.
MarkUp ..... 157.
Microcom
911 Utilities ..... 83.
Virex ..... 55.
Microseeds
INIT Picker 2.0 ..... 35.
Redux ..... 48.
Screen Gems 1.0 ..... 38.
Rival 1.0 ..... 48.
Now Software
Now Utilities 2.0 ..... 78.
On Technology
On Location ..... 74.



Microcom 911

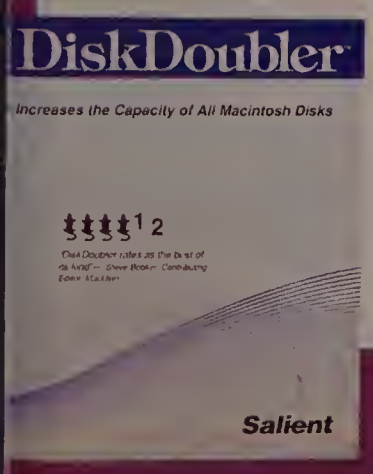
With 911 Utilities, you'll never have to worry when your Mac goes down. It takes you step by step through the process of getting your Mac up and running, and to revcover lost files. 1st Aid recovers data from damaged files or disks, and complete Undelete recovers most deleted files. Sector Collector finds and locks out bad sectors so that your drive can't try to write data where it won't be able to recover it. Virex detects and eradicates computer viruses.

911 ..... $83

GO Technology Hot Keys

Hot Keys, a unique set of pre-defined macros, gives Macintosh users greater efficiency and productivity by combining multiple functions into simple keystrokes. At the heart of the program is Apple's MacroMaker, so you are assured that the Hot Keys recording system is reliable and consistent. Less than one-half the price of QuickKeys.

Hot Keys $39



Salient Software Disk Doubler

Disk Doubler compresses your files whenever you save them, and expands them whenever you open them. In effect, it doubles your hard disk (and floppy disk) storage capacity. It works transparently within any application, and operates in the background under MultiFinder. Disk Double works with documents, applications, plus sound, graphics, and scanner files.

Disk Doubler $44

Preferred Publishers
Personality ..... 47.
Salient
Disk Doubler 3.0 ..... 44.
Softview
Mac In Use 3.0 ..... 69.
Software innovations
Hand Off II ..... 46.

SuperMac Technology
Disk Fit 1.5 ..... 57.
Symantec
S.A.M. 2.0 ..... 63.
S.U.M. II ..... 91.
Norton Utilities ..... 83.

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Rival 2001 including card $1199

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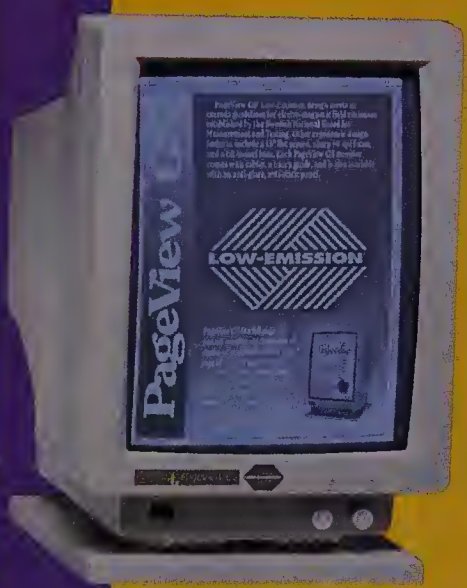
E-Machine T-16 Color Display

Spread out with almost twice the display area of the standard 13" color monitor. View your work exactly as will be printed at actual size - 72 dpi. Save almost one half the cost of a 19" color monitor. Get the sharpest, clearest color display at any price. The T16 has excellent colors, linearity, and sharpness, and it sells for a lo less than its larger cousins. The T16 is an excellent choice for CAD/CAM or color graphics. **Retail $2995.**

T16 Color Monitor $2275



Sigma Designs PageView GS

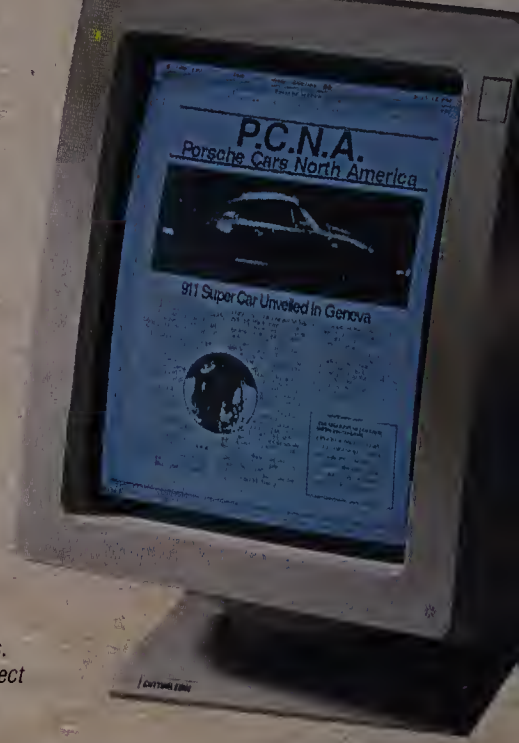
The PageView GS 15" Low Emission gray-scale portrait display for MacIIse or IIci plugs directly into the built-in video port, no adapter required. It supports 16 shades of gray at 640 x 870 (80 dpi). 75 Hz refresh provides flicker-free display. Includes pop-up menus, screen capture, multiple cursors, large menu fonts and screen saver. Paper-white phosphor, tilt/swivel base, front/panel on/off switch, contrast and brightness controls standard. **Retail for $899.**

Grayscale Monitor ... $649

Cutting Edge 15" Full Page Monitor

You can now eliminate all the scrolling, scrunching and squinting of small screen Macintosh computing. Word processing, financial analysis and graphics have never looked as good as they do on this full screen viewing area. The monitor can display an entire 8-1/2 x 11 inches of screen with a flicker-free refresh rate of 75 Hertz and a high resolution of 640 by 870 pixels

15" Monitor $579



** Special shipping charges apply for monitors. Call for details. All returned monitors are sujbect 15% restocking fee.*

Video Boards & Monitors

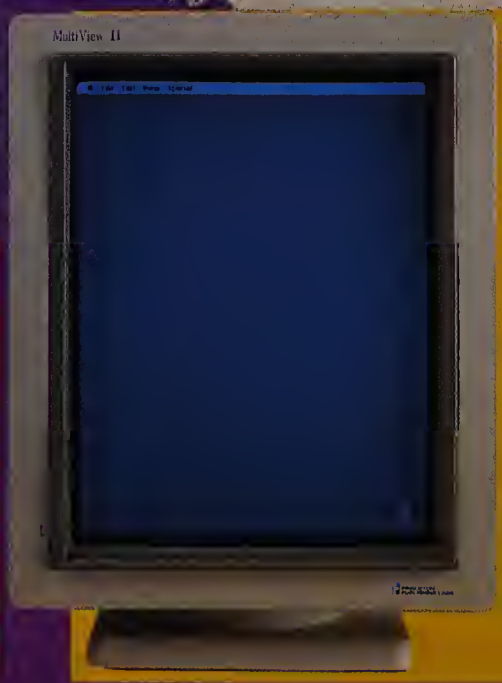
Micron - 8 Bit Color Cards
Resolution 640 x 480
Mac II or SE/30 ..... 345.
Resolution 1024 x 768
Mac II or SE/30 ..... 585.

RasterOps
ClearVue/GS Gray Scale
System Mac II & SE/30 .. 1692.
ColorBoards
208 (II, IIx, IIcx, IIci) ..... 290.
264 (SE/30 - 13") ..... 525.
264 (Mac II - 13") 435
364 (Mac II - 13") ..... 955.

RasterOps
Multi Media
364 w/AudioMedia ..... 1525.
364 w/Director ..... 1295.

Sigma Designs
L-View Multi Mode
SE/30 or Mac II ..... 1475.
Page View
SE, SE/30 or MacII ..... 850.
Silver View for Mac II ..... 1850.
Color Max 24 ..... 4350.

Sony - Color Multiscan
14" 1304 HG Color ..... 825.



New Full Page Plus and Classic Monitors

Princeton full page display with Lapis video card for the Macintosh Plus and Classic. Apple phosphor and 75Hz Vertical Refresh. Includes $25 Rebate coupon for dealer installation.

Classic $649
Plus $679

Lapis

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Established 1986

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210Mb Cobra External . $1475

PLI Infinity 40 Turbo Removable Hard Drive

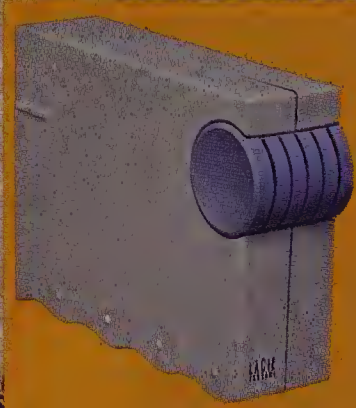
The Infinity 40 Turbo uses PLI's turbocharged driver software to attain a 20ms access time, and with the TurboCache disk accelerator software and TurboBoost, you can achieve near zero effective average access times. This removable 45MB drive gives you infinite storage potential with removable cartridges. Each one holds 44MB and costs only slightly more per megabyte than floppy disks.

40 Turbo Removable $750

Cutting Edge 20 Mb Drive

Cutting Edge hard drives represent the best value in Macintosh storage. Major enhancements include quieter fan, two power outlets and added surge protection.

20 Mb Drive $299



La Cie Tsunami

Tsunami drives come initialized with SilverLinning, the standard of hard disk utility software, and Silver Platter. Apple's system, five megabytes of public domain software and Norton utilites are also included on the drive. La Cie features a warrantyof 5 years on the Tsunami drive.

40 mb Drive ... $629

Applied Engineering 1.44 mb Drive

Applied Engineering's SuperDrive-compatible 1.44 Mb high density drive looks, feels runs, reads, writes, stacks and even smells like Apple's But it costs hundreds less. Access files almost instantly and copy disks without continually swapping disks. This drive incorporates the same high quality Sony Mechanism Apple uses and features auto-eject MS-DOS compatibility and exclusive two-way read/write indicator light. Also available in 800K.

1.44 MB Drive $225
800k Drive $195

EMAC Impact Drive

The EMAC Impact hard drives pack all the power and convenience of a full-sized drive into a compact chassis.
Now all your files and applications can be stores in one easily accessed location. Impact drives come in three capacities and are built with precision-engineered drive mechanisms for whisper-quiet, high-speed operation.

105 mb Drive $805

Hard Drives

Quantum External
40MB ..... 428.
80MB ..... 598.
105MB ..... 679.
120MB ..... 768.
170MB ..... 928.

Quantum Internal
40MB ..... 349.
80MB ..... 569.
105MB ..... 599.
120MB ..... 768.
170MB ..... 869.

Cutting Edge
Seagate Mechanisms
30MB External ..... 379.
45MB External ..... 439.

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Seagate Mechanisms
60MB External ..... 469.
80MB External ..... 529.
SyQuest Mechanisms
45MB Removable ..... 679.

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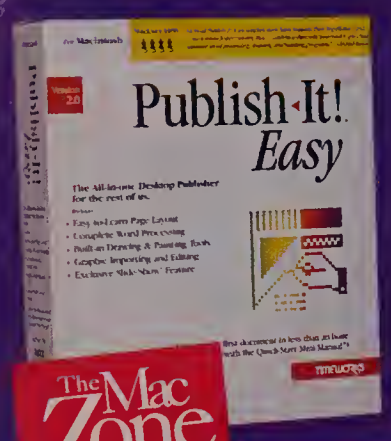

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Programmers Online Companion 2.1 ..... 35.

Bright Star
Alphabet Blocks ..... 29.
Talking Tiles ..... 25.

Brøderbund
Calculus ..... 57.
Geometry ..... 57.
Physics ..... 57.
Type! ..... 17.

Carina
Voyager 1.2 ..... 86.

Davidson & Associates
Math Blaster - Mystery ..... 29.

Earthquest, Inc.
Earthquest ..... 48.

First Byte
The Dinosaur Discovery Kit 25.
Kid Talk or Math Talk ..... ea33.
Math Talk Fractions ..... 26.
Spell-A-Saurus ..... 30.
The Puzzle Story Book ..... 26.

Goldslein & Blair
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Bible & What Do I Do Now? Book Combo ..... 31.
Bible & What Do I Do Now? & Software Combo ..... 39.

Great Wave
KidsMath or Kids Time ..... 25.
NumberMaze ..... 25.

Hyperglot
Russian
Introduction ..... 28.
Word Torture 3.0 ..... 28.
Verbal Aspect - Inter. ..... 41.
Noun Tutor(Sound) ..... 58.
Spanish
Word Torture 3.0 ..... 28.
Verb or Tense Tutor ..... 41.
Pronunciation Tutor ..... 34.
French
Word Torture 3.0 ..... 28.
Pronunciation Tutor ..... 34.
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Word Torture 3.0 ..... 28.
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Word Torture 3.0 ..... 28.
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EasyKana ..... 125.

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Combo Packs w/Workbook
Algebra Combo Pack ..... 44.
Calculus Combo Pack ..... 44.
Pre-Calculus Combo Pack .. 44.

Visionary Software
Lifeguard ..... 48.

Entertainment

Accolade
Ishido:Way of the Stones ... 33.
Stratego ..... 35.
Jack Nicklaus' Greatest 18 . 35.

Activision
Cosmic Osmo ..... 39.
Manhole ..... 27.
Shanghai ..... 18.

Addison Wesley
The Hobbit ..... 22.

Brøderbund
SimEarth ..... 39.
Ancient Art of War ..... 25.
Ancient Art of War at Sea .... 25.
Shufflepuck Cafe ..... 22.
SimCity 1.1 ..... 28.
SimCity Color ..... 46.
The Playroom ..... 28.

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Crystal Quest 2.2 ..... 28.
w/Critter Editor ..... 39.
Mission Starlight ..... 28.
Sky Shadow ..... 28.

Cinemaware
3 in Three ..... 31.

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Chuck Yeager's A.F.T. ..... 31.
Weaver Baseball ..... 33.
Starflight ..... 39.

Infocom
Arthur: Quest for Excalibur . 28.
Quarterstaff ..... 19.
Leather Goddess of Phobos 19.

Inline Design
Bomber (w/Headphones) ... 31.
Darwin's Dilemma ..... 31.

Lucasfilm
Pipe Dream ..... 16.
Indiana Jones: The Last Crusade ..... 33.

Microsoft
Flight Simulator 1.02 ..... 31.

Mindscape
Global Dilema-Guns & Butter ..... 33.
Loopz ..... 33.
Balance of Power 1990 ..... 29.
Trust & Betrayal ..... 26.
Uninvited ..... 26.

Mysterium Tremendum
Moriarty's Revenge ..... 31.

New World Computing, Inc.
Might and Magic II ..... 38.

Postcraft International
Citadel ..... 26.
with Secrets ..... 37.
Secrets ..... 14.

Sphere
Falcon 2.2 ..... 29.
Tetris ..... 20.
Welltris ..... 20.

Sphere
Faces...Tris III ..... 20.
Vette! ..... 32.

Strategic Simulations, Inc.
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Strategic Studies Group
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Sands of Fire ..... 32.
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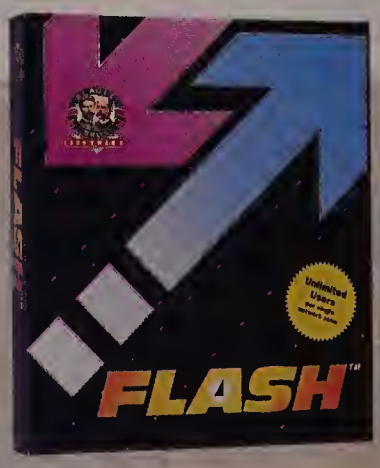

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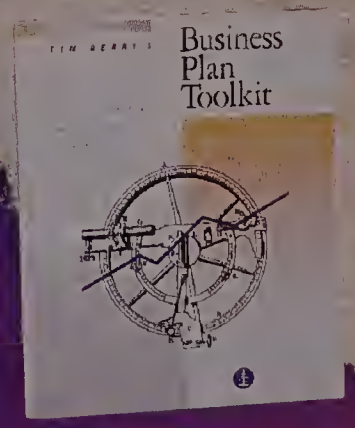

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FastTrack Schedule 1.5 .... 138.

AISB
How to Write a Bus. Plan .... 85.

Aldus
Persuasion 2.0 ..... 328.

ASD
Planisoft- single ..... 138.

Blyth Software
Omnis 5 1.03 sgl user ..... 645.
Omnis 5 1.2 Incrementer ... 58.

CE Software
Alarming Events ..... 84.

Chang Labs
C.A.T. III ..... 288.

Claris
FileMaker Pro ..... 217.
MacProject II 2.0 ..... 363.

Delta Point
Delta Graph 1.5 ..... 108.

Fox Pro/Mac
FoxBASE+ 2.0 ..... 291.
FoxBASE+ Multi User ..... 383.
FoxBASE+ Runtime ..... 174.

Individual Software
Power Macros for Excel ..... 33.

Informix
Wingz 1.1A ..... 244.

Jam Software
Smart Alarms single user ... 62.

Kiwi Software
KiwiEnvelopes! ..... 33.

Mainstay
MacFlow 3.5 ..... 157.
MacSchedule 2.0 ..... 125.
MacSchedule Plus ..... 215.

MediaGenic
Focal Point II ..... 116.

Micro Planning Software
Micro Planner Plus 6.1e ... 324.

Microsoft
Excel 2.2 ..... 239.
File 2.0 ..... 123.
Office ..... 518.
PowerPoint 2.01 ..... 244.
Works w/ Quicken ..... 185.

Objectic Systems, Inc.
Fast Pitch ..... 117.

Odesta
Double Helix III ..... 388.

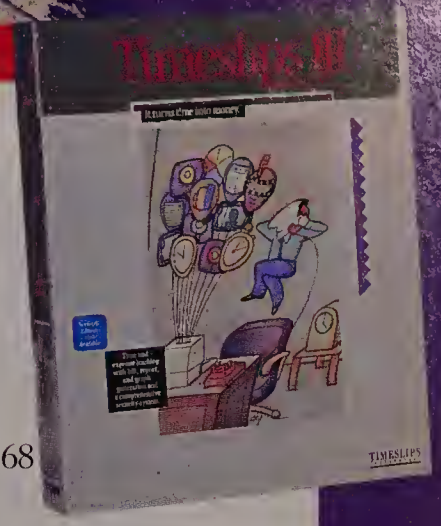
Power Up!
Address Book + ... 51.
Fast Forms ..... 104.
Calendar Creator ..... 34.

Preferred Publishers
DAtabase 1.5 ..... 66.
Direct Mail ..... 50.

Prescience
Expressionist 2.03 ..... 78.
Theorist 1.1 ..... 250.

Softview
if:x Forms Designer ..... 168.

Software Discoveries
Record Holder Plus ..... 82.



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Atlas * Mapmaker 4.5 ..... 368.

Symantec
MORE 3.0 ..... 259.

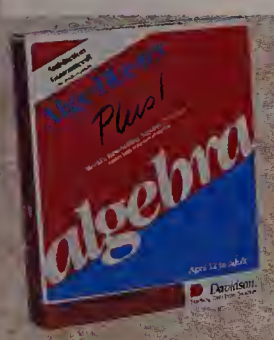
Symmetry
Key Plan ..... 242.

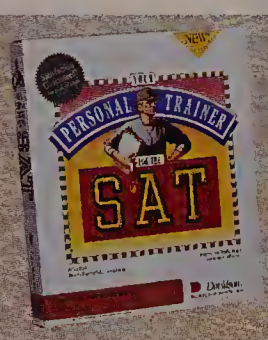
Vertical Solutions
FastCat ..... 42.

Vertical Solutions
FastEnvelope ..... 42.
FastLabel ..... 42.

Wolfram Research, Inc.
Mathematica - Enhanced .. 718.

Zedcor Inc
Desk 3.03 ..... 218.





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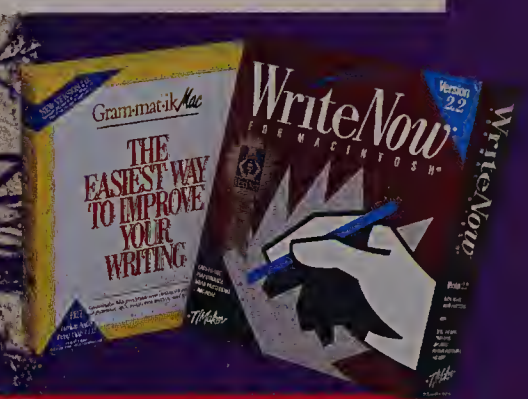

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Computer Associates
Simply Accounting 1.1 ..... 224.

In-House Software
In-House Accountant ..... 135.

Igman Software
Business Sense ..... 160.

Intuit
Quicken ..... 35.

Peachtree
At Once! ..... 282.
Insight Expert Series ... ea. 394.

MECA Ventures Inc.
Managing Your Money ..... 121.

Nolo Press
For the Record 2.0 ..... 32.
Will Maker 4.0 ..... 36.

Softview
Business, DOD & GSA Expense Reports ..... ea. 49.
Personal Tax Analyst ..... 49.
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Mac InTax 1040 ..... Call.
State Supplements ..... Call.

Softview
Tax View 1040 Pro ..... Call.
Tax View 1020 Corp ..... Call.

Software Toolworks
Dollars & $ense 5.0 ..... 77.

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M.Y.O.B. ..... 142.

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Turbo Mouse ADB ..... 107.

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300ZS ..... 1,831.

Microtouch
UnMouse ..... 180.

MSC Technologies
Little Mouse A+ 512k/Plus . 69.
Little Mouse A+ ADB ..... 74.

Olduvai Software
Read-It! Personal 2.1 ..... 138.
Read-It! OCR 2.1 ..... 277.

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Circle 96 on reader service card

All the Colors of Space

FIRST CAME CALIBRATION; NOW TRUE MATCHING IS IN THE WORKS

BY BRUCE F. WEBSTER

The system I'm using to write this column has two monitors, one 13-inch and one 19-inch, both Sony Trinitrons. They display the same color background pattern, but that pattern looks brown on one monitor and dark salmon on the other. And making a hard copy of the image on a color printer yields output that varies from both displays. Anyone who works with color faces some basic questions: Can these devices be coordinated in their color representations? If so, how does the final result mesh with the rest of reality? And what might it cost to accomplish all this?

Oh, Say, Can You CIE?

The problem with color spaces, mechanisms for specifying colors, is that they are device specific and somewhat subjective (for definitions of color expressions see "Colorful Terms"). My two monitors persist in displaying different colors for the same RGB/HSV value. Current products let me calibrate the two monitors so that they show the same set of colors—but which set should they show? And how do those colors relate to what I might get by printing an image using the same RGB/HSV value appropriately translated to CMYK?

The answers, such as they are, lie in a color space defined 60 years ago by an international committee, the *Commission Internationale L'Eclairage* (CIE). Without today's technologies to tempt them into compromise, the CIE produced a solution that was accurate, complete, and based on reality. Unlike the color models mentioned above, the CIE color space encompasses all possible visible colors.

There are actually several CIE color models (CIE XYZ, CIE xyY, CIE LUV, and CIE LAB), but they represent different mappings into the same space and can be translated one into the other. You can also create a *calibrated* RGB, HSV, or CMYK color model by defining each point (color value) in that color space as having a particular CIE specification.

Characterization

The potential value of the CIE color space lies in its objectivity. With the right instrumentation, you can analyze a given color from a given device and determine what its CIE specification is. If you do that for the device's complete gamut of colors, you then have a CIE specification for each color in that device's native color space (RGB, CYMK, and so on). This process is often called *characterizing* the device; the resulting data is called the *device profile.*

Characterize two or more devices, and you then have a means by which you can—in theory—reproduce on one device the exact color generated by another. Suppose a characterized display is producing a color (red, green, or blue) in RGB space. That display's device profile tells what the corresponding CIE specification (x,y,z) is for that color. To reproduce that color on a characterized printer, you use the printer's device profile to convert the CIE specification (x,y,z) into the printer's CMYK color space, producing the color (c,m,y,k).

Problem solved, right? Wrong. If the display and the printer have different gamuts, which they almost certainly do, the printer may be unable to produce a specific color corresponding to a given CIE specification (x,y,z). A complementary problem is the inability to see on the display certain colors the printer can produce. For true color matching, both issues must somehow be addressed.

Calibration

So far, plenty of companies are interested in tackling those problems. One of the oldest (and most expensive) approaches is RasterOps' self-calibrating monitor, which uses equipment originally manufactured by Barco. While this monitor keeps itself calibrated, it has no facilities for color matching with other monitors or with output devices. RasterOps has some new solutions under development but wasn't willing to discuss them as of this writing.

(continues)

Circle 339 on reader service card.

The major pioneer has been Radius, with its PrecisionColor Calibrator. One end of this device connects to an ADB port and the other attaches to the front of a color display. The PrecisionColor calibrates by comparing the actual colors produced to the signals being sent to the display. The software (which runs as a Control Panel device) then adjusts two of the display's color attributes (gamma value and color temperature) to user-selected values. That way you can ensure display consistency for a given monitor over time. And by using the same settings for different monitors, you can ensure color consistency between those monitors.

That's all nice, but it does little to address coordinating display colors with output colors. Radius has tackled that problem by working with Pantone Inc. to produce CIE specifications for the entire set of Pantone Matching System (PMS) colors, a printing industry standard for spot color. With these specifications, the PrecisionColor Calibrator can adjust a supported monitor to accurately display PMS colors. Furthermore, Radius and Pantone are working together to promote these specifications as an open standard.

The trick, though, is being able to pick those PMS colors within an application. Apple's standard Color Picker doesn't support direct selection of PMS colors, so the application has to have a custom picker; furthermore, that picker must use the data produced by the PrecisionColor Calibrator in order to match the PMS colors with the correct RGB values. Radius has created such a picker with supporting routines, and (according to Radius) it has been implemented in applications by companies that include Aldus, Adobe, Letraset, Electronic Arts, and Quark. But that solution doesn't handle colors outside the Pantone gamut, nor does it handle continuous-tone color images such as art or photos, or direct output to printers that don't support PMS colors.

Color Matching

SuperMac, seeing that opening, has formed an alliance with Tektronix to produce a more general solution. The result is the SuperMatch Professional Color Matching System. The hardware component, the SuperMatch Display Calibrator, looks and works very much like the Radius calibrator, though SuperMac claims greater flexibility in setting gamma levels and color temperature. The company also claims its product can calibrate a larger assortment of monitors than Radius's can. Both of those differences may well have disappeared (or at least narrowed) by the time this column sees print; at any rate, they will be a source of constant change and competition.

What is more significant about the SuperMac product is its approach to color matching. The calibration process allows the SuperMatch software to establish a relationship between the display's color space and the TekColor color space. TekColor, developed by Tektronix, uses a calibrated HVC (hue, value, chroma) color model based on CIE specifications. Tektronix is promoting TekColor as an open standard. (Does anyone promote closed standards?)

The SuperMatch system also supplies an alternate color picker as well as Apple's standard Color Picker. The alternate picker not only allows direct color selection from the TekColor color space but it can also display as overlapping regions the color gamuts of both the current display and a selected, TekColor-characterized printer. This allows the user to limit color selection in the document to the gamut common to both, while the calibration ensures that the colors will appear the same on display and output. And since the color picker is implemented on a system-wide basis, no special application support is required.

The key phrase above, of course, is *TekColor-characterized printer.* To date, there are only two: the 4693DX and the ColorQuick, both from Tektronix. Other companies have announced their intent to support the SuperMatch system, but it remains to be seen, however, how many will actually characterize their products and how soon.

Newcomer to the Fray

The most recent entry into this fray is Kodak, which—you guessed it—has announced an open standard for color

(continues)

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calibration and matching. Kodak's angle is different, however. The Kodak Photo CD system, scheduled for commercial release in 1992, will transfer photographic images from 35mm film negatives and slides, to high-resolution (2048-by-3072-pixel) digital images stored on write-once compact discs, to printed pictures—all at consumer prices. With Kodak's system, color information shouldn't get lost or muddled along the way. And, if the Kodak system works, third-party computer systems should be able to access, display, and print those digital images with a great deal of fidelity.

Its strategy may be different, but Kodak's basic approach is not. The company has announced a device-independent color model, PhotoYCC, that bears some parallels to Tek-Color. PhotoYCC is a calibrated RGB model based on the CIE color space, with primary colors identical to those agreed upon by the companies developing high-definition television (HDTV) technology.

Kodak has also announced its own color-management system for device calibration and profiling, much like SuperMatch. Kodak has said it intends to have these technologies available for Macintosh, DOS and Windows, OS/2, and UNIX environments.

Like the other companies, Kodak has a list of third parties pledging support to one degree or another for the newly announced technologies. But the names on Kodak's list are a bit weightier and include IBM, Apple, Sun, Hewlett-Packard, Digital Equipment Corporation, and Next. Software vendors announcing support for PhotoYCC include Aldus, MacroMind, AutoDesk, and Software Publishing. Perhaps most significant, Adobe has announced that PhotoYCC will be directly supported in PostScript Level 2 and will be documented in the revised edition of the *PostScript Language Reference Manual*.

Who Needs It, Anyway?

How is this all going to sort out? Of these various standards which will predominate? One might favor Kodak because of its very deep pockets, broad market presence, and heavy-duty lineup of third-party supporters.

(continues)

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COLORFUL TERMS

A *color space* (or *color model*) is a mechanism for specifying colors. A *gamut* is the range of colors that can be produced or displayed by one device. Each device has a fixed gamut but can be driven by more than one color space. When you choose a color space for a particular device, say a monitor, any color that you actually see on the display is produced by a combination of software and hardware. Based on the color's specification, the hardware and software causes the monitor to output a color from the monitor's gamut.

Each color within a color space is usually defined as a set of values. For example, the red-green-blue (RGB) color space—the default for Color QuickDraw and most color display boards—defines each color as a combination of three values: one representing the red, one the green, and one the blue component of that color. An absence of these three primary colors yields black; the maximum amount of all three mixed together yields white.

The hue-saturation-value (HSV) color space, sometimes called hue-saturation-brightness (HSB), also uses three values, representing the actual color (hue), its degree of mixture with white (saturation), and its overall brightness (value). The RGB color space converts directly to the HSV and vice versa; Apple's standard Color Picker lets you use either one in specifying a color, and the Color Picker's color wheel is oriented more on the HSV model than on the RGB model.

Another important color space is the cyan-magenta-yellow (CMY) color space. This model is used primarily for printers and other output devices that start with a white background and mix cyan, magenta, and yellow—the subtractive primaries—to produce various colors up to and including black. Since it's sometimes hard to get a true black with a CMY mix, the CMYK model adds a fourth component, black. The CMY and RGB color spaces have a direct relationship and are easily convertible back and forth.

I *do* favor Kodak, but for a completely different reason: it's the only company planning a solution that considers the needs of a significant number of computer users. Face it—few Macintosh users have a compelling need for precisely matching their displays with color printer output, and fewer still care whether their monitors match someone else's. Serious users of color prepress and high-end publishing will definitely need calibration and matching, as will print shops and in-house departments using color PostScript printers. But that's a tiny fraction of the Macintosh marketplace, which itself is a small percentage of the entire computer market.

In contrast, Kodak plans to offer a consumer product—Photo CD—that could be of interest to literally millions of people. If Kodak is successful, in 1992 you'll get your 35mm film developed onto a CD for less than $20 per roll—with a single CD holding up to 100 photos—and then view those pictures on a computer or TV set using standard CD ROM XA and CD-I drives. Given the commercial potential of Photo CD, every computer manufacturer supporting CD ROM drives will want to support Photo CD and, thus, PhotoYCC.

This is not to say that the products from Radius, SuperMac, and others will disappear. Each is likely to be successful in its own niche; in time, some may also come to support PhotoYCC. Whatever happens, though, it seems certain that most Mac users will continue on, content with the colors on their uncalibrated monitors and uncharacterized printers. And with good reason: it gives them all the colors they need or care about. M

Contributing editor Bruce F. Webster is vice president of R&D at San Diego-based Pages, Inc. He can be reached via BIX (bwebster) and via MCI Mail (Bruce Webster).

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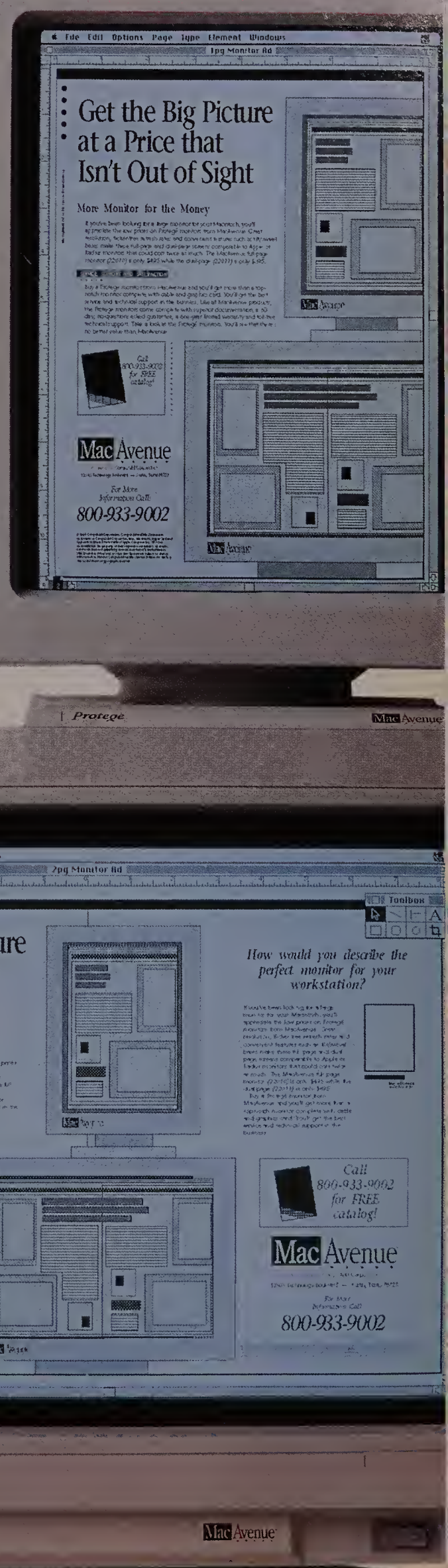

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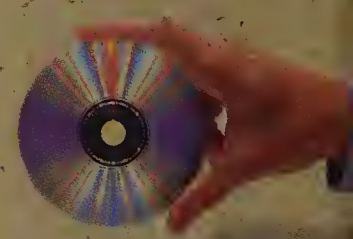

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Circle 276 on reader service card

MACWORLD NEWS

by Dan Littman and Tom Moran

Newfound FreeHand

It must be nice to schedule a product release for three months after the arch-competition's product ships. It certainly gave Aldus time to think about Adobe's Illustrator 3.0, and to get Aldus FreeHand 3.0 ready to compete with it.

FreeHand 3.0's simplified interface adds several palettes that eliminate many trips to dialog boxes. You can name, move, and print layers from the Layers palette, or store custom halftone screens, line colors, and the like on the Styles palette.

FreeHand 3.0 has no type-size limit, and, like the new Illustrator, it can convert Type 1 and Type 3 fonts to modifiable outlines. Unlike Illustrator 3.0, FreeHand 3.0 won't let you edit text on screen or link boxes for flowing text, but wrapping text around the inside or outside of elliptical shapes (not an easy task in either program) is simpler than in earlier versions of FreeHand.

FreeHand's drawing tools have greatly increased accuracy and some new features. The Composite Paths command lets an object show through holes in a superimposed object, and you can select objects within a group, both features matched by Illustrator. FreeHand 3.0 also automatically groups elements in a blend and automatically reblends when you make changes. (Automatic reblend can be turned off for speed, and, even in beta form, FreeHand 3.0's screen redraw is faster and smoother than in 2.0.)

FreeHand 3.0 can display and separate color TIFF images, allows you to work in preview mode, and supports monitor and printer calibration—all features lacking in Illustrator. Illustrator 3.0, on the other hand, has a set of graphing tools that shorten the cycle of preparing graphs and charts.

Glenn Mitsui of Studio M D used Aldus FreeHand 2.0 to create this piece for the LDR Leader. He incorporated TIFF images "to. . . add a human element to a vector-based illustration."

Pricing for Aldus FreeHand 3.0 was not set at press time. For more information, call Aldus in Seattle, at 206/622-5500.—**D.L.**

Cloud over SyQuest

A pair of lawsuits filed by peripherals vendor Microtech International and removable hard drive manufacturer SyQuest have cast a shadow over the reputation of SyQuest's very popular SQ555 drive mechanism. Microtech's suit, which alleges that SyQuest failed to meet a guaranteed failure rate of 5 percent or less, was filed in October. SyQuest subsequently sued Microtech for nonpayment of $851,000 allegedly owed by Microtech for drives it received from SyQuest. SyQuest is also suing Microtech for making "false and misleading" remarks about SyQuest.

The controversy centers around the reliability of the SQ555, which is the heart of removable hard drives that are currently sold by about 18 to 20 peripherals vendors. The SQ555-based drives are the de facto standard for removable media in the Mac market, with about 500,000 installed units, according to SyQuest. Microtech says it experienced a higher-than-acceptable rate of failure with the devices, and that repeated attempts by both companies to solve the problems were unsuccessful. SyQuest says that its overall return rate, including drives that were dead on arrival or were later rated "no problem found," is about 6.7 percent, with a smaller percentage being actually defective. Some of the drives were also simply damaged by users, SyQuest notes.

SyQuest vice president of market-

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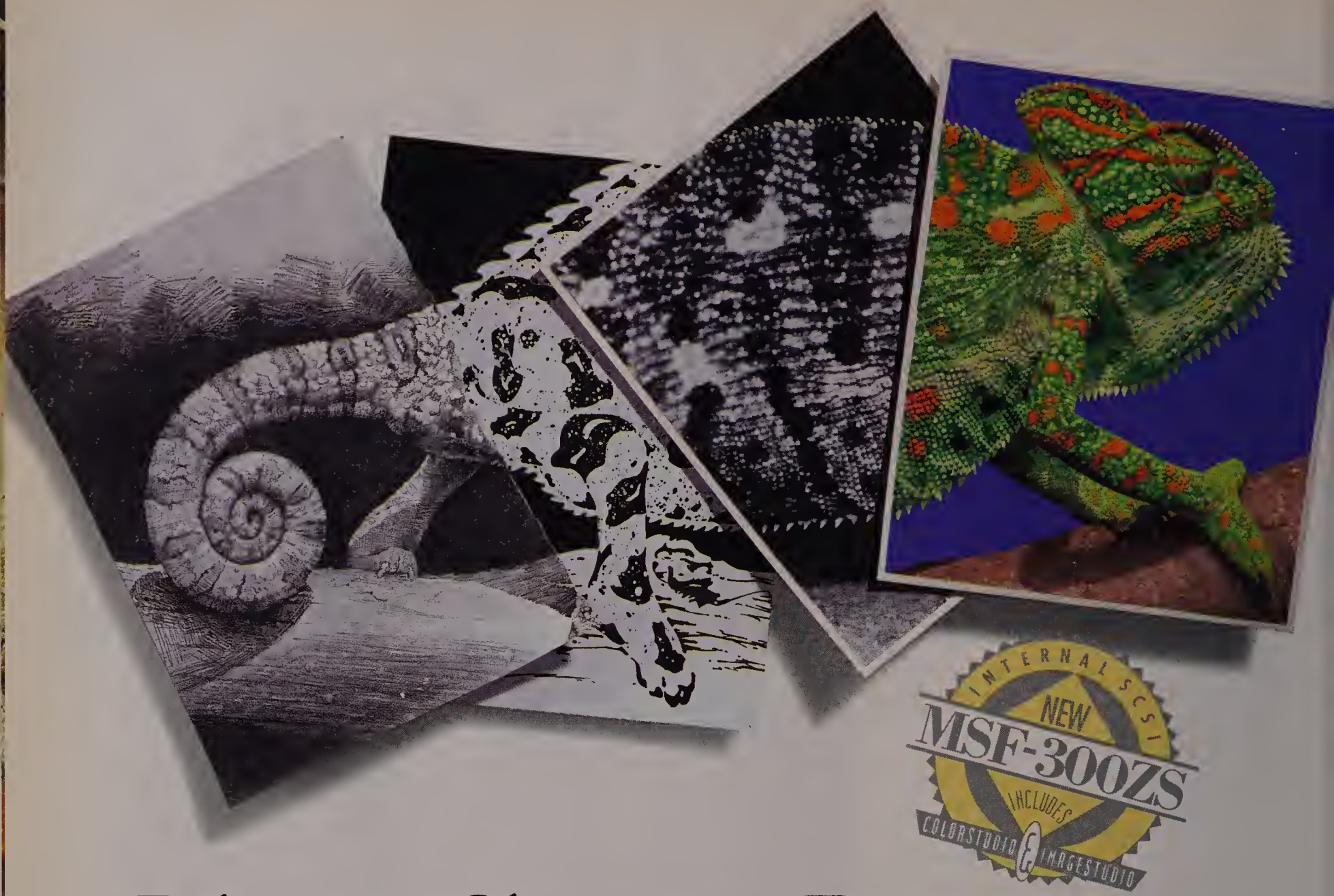

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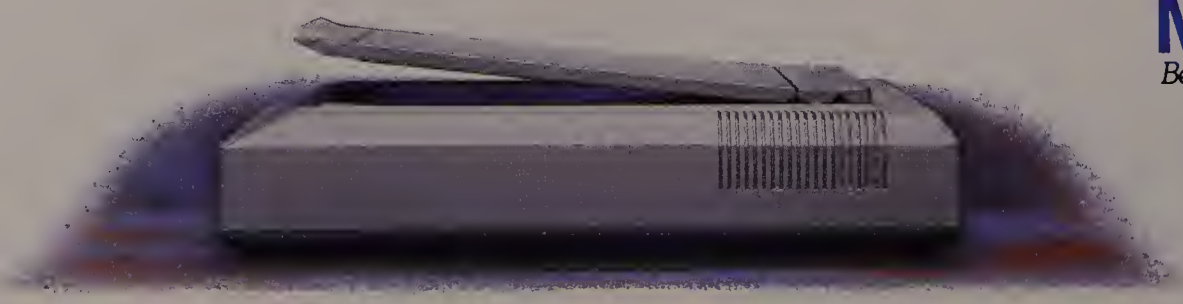

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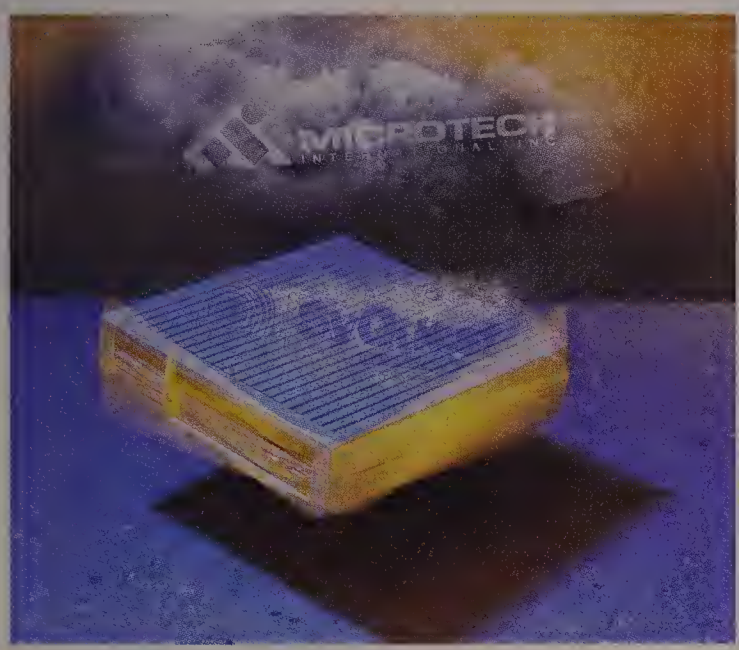
Circle 68 on reader service card

ing Joel Levine says its return rate would be unacceptable to one of the leading makers of fixed hard drives, but that it's the best reliability record for a removable-cartridge hard drive. Removable-cartridge hard drives are inherently less reliable than fixed hard drives because of the fine tolerances required in spindle alignment, insertion mechanisms, and of course the read-write head, which flies a few microns above the magnetic media. Mishandling of the cartridges can also lead to failure of drives and cartridges.



TOM GIBSON

Lawsuits between Microtech and SyQuest have cast a cloud over the reliability of SyQuest's removable drives.

One of SyQuest's biggest problems, according to Levine, is that it sells its drives to third-party resellers who add the power supplies, cables, and utility software. That means that a marginal connector combined with a marginal cable can lead to intermittent signal problems, or that a lower-quality power supply can simply fail when there's no problem with the drive or the media cartridge. "Microtech is having more than its share of problems," says Levine. However, Microtech president Cliff Wildes says that Microtech purchased SyQuest drives from other third-party vendors and tested those drives with the other vendors' hardware and software, but still found the same problems. Wildes also says that Microtech owes SyQuest less than the $851,000 figure cited by SyQuest.

Microtech however, points to a letter from Syed Iftikar, founder of SyQuest, that in part apologizes for his company's inability to meet the 5 percent failure rate. "Five percent or less [returns] over the life of the warranty was guaranteed to us, and that's a two-year warranty," says Wildes. "It was more than 5 percent in the first year." But SyQuest says that its apology is an example of its policy that the customer is always right, not an admission of guilt. "When a customer has a complaint," says Levine, "you don't say, 'You're wrong.' You say, 'Let's work it out.'"

In any case, Microtech has gone to a Ricoh removable hard drive mechanism that it says is more reliable because its cartridges have a better seal against dirt. And SyQuest, which says its revenues have climbed to record levels, is building a new facility to try to catch up on a backlog of orders for its removable-media cartridges. Meanwhile, dealers and users generally report that the SQ555's reliability is acceptable, although there are more problems with removable drives in general than with fixed drives. One dealer reported that when dropped, SyQuest cartridges usually survive with no damage, but that occasionally they are damaged in a way that makes the data completely unrecoverable because the disk can no longer be centered on the drive spindle.

The best recommendation is that you use a removable drive in conjunction with a fixed disk drive. That makes backups a lot easier, and if one drive fails, you still have the other. If you do decide to go with just a floppy disk drive and a removable hard drive, be careful to make backups, even though they may require a lot of insertion and ejection of floppy disks, or of the cartridges (having more RAM helps).

If you have a problem with a SyQuest-based R45 or Europa 45R drive from Microtech, the latter company says it is offering the same support as before the lawsuits and that it has purchased 500 mechanisms from third parties so it can replace or repair defective drives. Also, SyQuest said it is offering direct support to owners of SyQuest drives, regardless of which third-party integrator sold it. For more information, contact Microtech in East Haven, Connecticut, at 203/468-6223, or SyQuest in Fremont, California, at 415/438-5500 or 800/245-2278.—**T.M.**

The Big Crunch

Back at the dawn of the Macintosh era, David Russell wrote MathView Professional, a prodigiously fast engineering-math program, while he was working full-time as a mathematician at Lockheed.

As the newer Macs began to resemble workstations, Russell decided it was time for a new kind of software. His vision of a utopian program for engineers and applied scientists called for an encyclopedic function set, a highly evolved Mac interface, blazingly fast 2-D and 3-D graphics, and a built-in scripting language.

After pulling together a management team and financing, Russell formed Bimillennium Software to market his new product, HiQ. It is hardly an exaggeration to say that HiQ compares to older equation-solving packages the way Microsoft Excel compares to the Calculator DA. Work in HiQ is organized in Project Notebooks, on-screen representations of 3-ring binders, each with a title page, a table of contents, a work area, and an index. In the work area, you can use a repertoire of more than 500 basic and high-level functions (HiQ solves not just ordinary differential

DRAKE SOREY

Making science on the Mac: (left to right) John Cavalier, Dave Russell, Phil Erkenbrack, Larry McGraw.

(continues)

AW...WHAT THE HECK!

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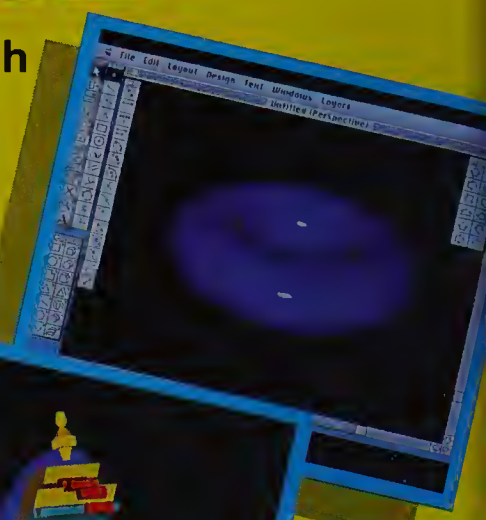

When we introduced this product we had to ask ourselves, "What should DesignCAD cost?" To help with our decision we hired accountants. We consulted with industry "movers and shakers". We purchased the finest spreadsheets available. Many people said, "The software should sell for $3,000.00 or more." Others said, "It's good, darn good—sell it for at least $2,000.00." Opinions varied. Finally we said, in the Great American Tradition, "Aw . . . What the Heck! Let's see the competition beat this **$699.00.**

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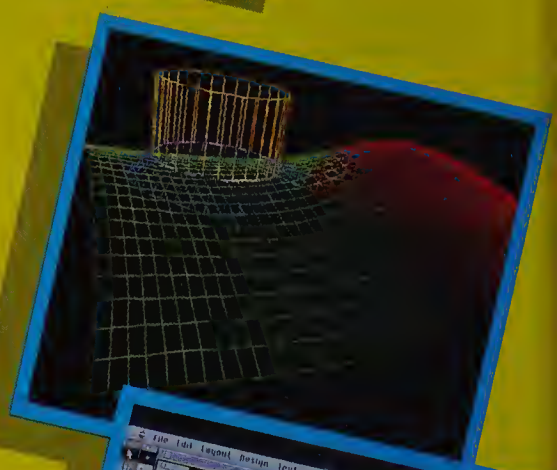

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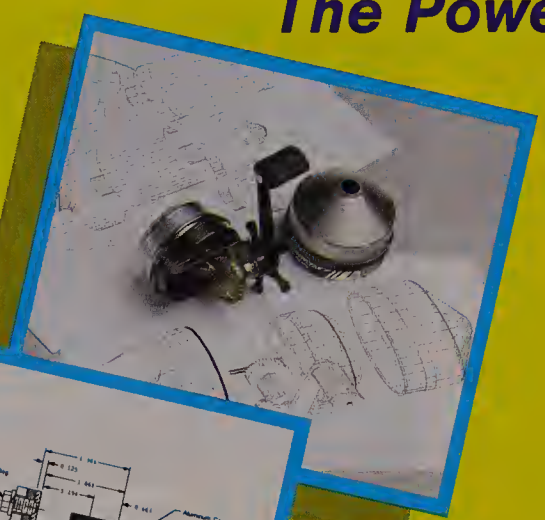

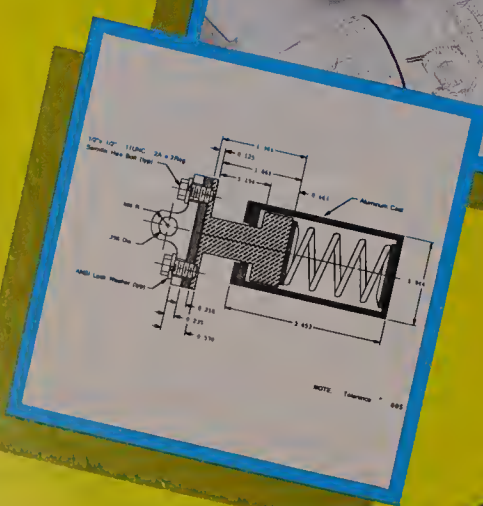

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equations but, with a few commands, 2-D boundary-value problems), view and manipulate graphics at impressive speed, and store command sequences automatically as scripts. Q-Script, the scripting language, lets you combine tasks and define new functions with programming statements in a Pascal-like pseudo-code. HiQ's sophisticated help system recommends optimal algorithms from information it collects during the solving process.

Though still in beta form, HiQ easily zips past any of the programs tested in *Macworld*'s January 1990 overview of math programs when doing matrix computation and numerical integration.

Bimillennium is developing HiQ for UNIX and IBM's RS/6000. The company also has plans for a compiler and a finite-element-analysis package after HiQ is out the door (ship date is scheduled for April). There will also be a student version of HiQ that does not require a math coprocessor. If you have a complex problem with a numerical answer (HiQ doesn't do Mathematica-style symbolic computation), it's the fastest way to get that answer short of buying yourself a Cray.

HiQ will list for $495 for three months after it ships, and then for $695. Later products have not been priced. For more information, contact Bimillennium in Los Gatos, California, at 408/866-2010.—**Charles Seiter**

The Mac Desktop Reconsidered

Ever wonder why the Mac's desktop metaphor ends so abruptly? Why can you drag an object around inside a MacDraw document—but to move it to another document you first have to copy it to the mysterious Clipboard?

Belgian programmer Martin Scheffer asked himself the same questions and concluded that there is no good reason. So he is writing software that breaks down the barriers between documents and even between applications. For example, using the as-yet-unnamed utility you could select a range of cells in a spreadsheet and drag it right out of the spreadsheet window into a word processor document. The utility uses the XTND technology, but it is designed to work with anything, not just XTND-aware applications.

KEN PROBST

Belgian Martin Scheffer discovers American coffee on a rainy San Francisco day.

What else does Scheffer's program let you do? Under MultiFinder you can select part of a document and drag it to the Finder; let go and it becomes a new document. Or drag a paint file from the Finder into your word processor and the image appears in the middle of a sentence.

Scheffer plans to distribute his product in the United States through asd Software (asd also publishes Scheffer's FileGuard). He expects it to list for about $149. For more information, contact asd in Montclair, California, at 714/624-2594.—**D.L.**

Managing Pages

With dozens, hundreds, or even thousands of elements making up a QuarkXPress document, it can be tough to keep track of them all. Page Director, a stand-alone application and QuarkXPress plug-in, tackles that problem by pulling together all the elements of a publication, keeping track of their sizes, locations, positions, page jumps, and even use of color. You can position the elements on dummied-up pages or on a spreadsheet-style run sheet that shows name, number of columns, depth, page number, section, type, color, jumps, and so on. You can even attach comments to any element or page.

Once you've built the dummy, you save it as a Page Director file, open XPress, and import the Page Director file for fine-tuning.

One very clever feature of Page Director is its ability to suggest color configurations for different sizes of publications—telling you where color is available based on printing signatures. If you place a color element on a page that isn't marked for that color, Page Director gives you the option of changing the item's color, moving it to another page, or changing the publication's color configuration.

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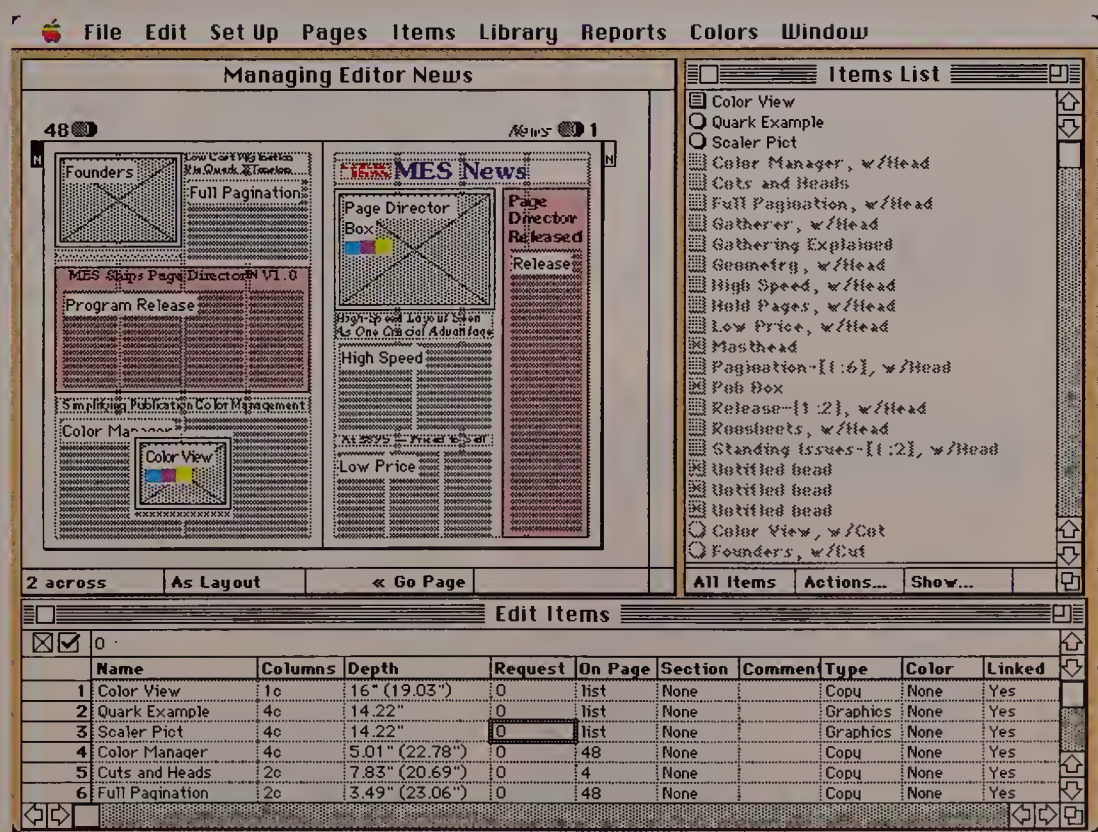

Managing Editor Software's Page Director lets you create quick page mock-ups, keeps a database of all elements in a publication, and can convert files to QuarkXPress format.

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Page Director's reports are perhaps the biggest boon to the managing editor. The reports list all the elements on a page; provide information on the color configuration and all color elements; detail comments for all the elements in the file; and list all the source files making up the publication.

Managing Editor Software is also developing Ad Director, which will automate dummying and positioning ads with tools for automatic issue layout, coupon handling, reverses, advertiser conflicts, and page requests.

Page Director lists for $895; Ad Director's price was not set at press time. For more information, call Managing Editor Software in Elkins Park, Pennsylvania, at 215/635-5074.—**Steve Roth**

MacDraw Goes Pro

The Mac's first object-oriented graphics program is getting a big upgrade. MacDraw Pro has bezier curves, some CAD-like capabilities, and improved control over text and color.

Pro supports Claris's XTND file-translation capability, so it can import paint, 24-bit TIFF, and EPS files, and can pour text into blocks, with full word-processing controls including tracking (but not kerning) and spelling checking.

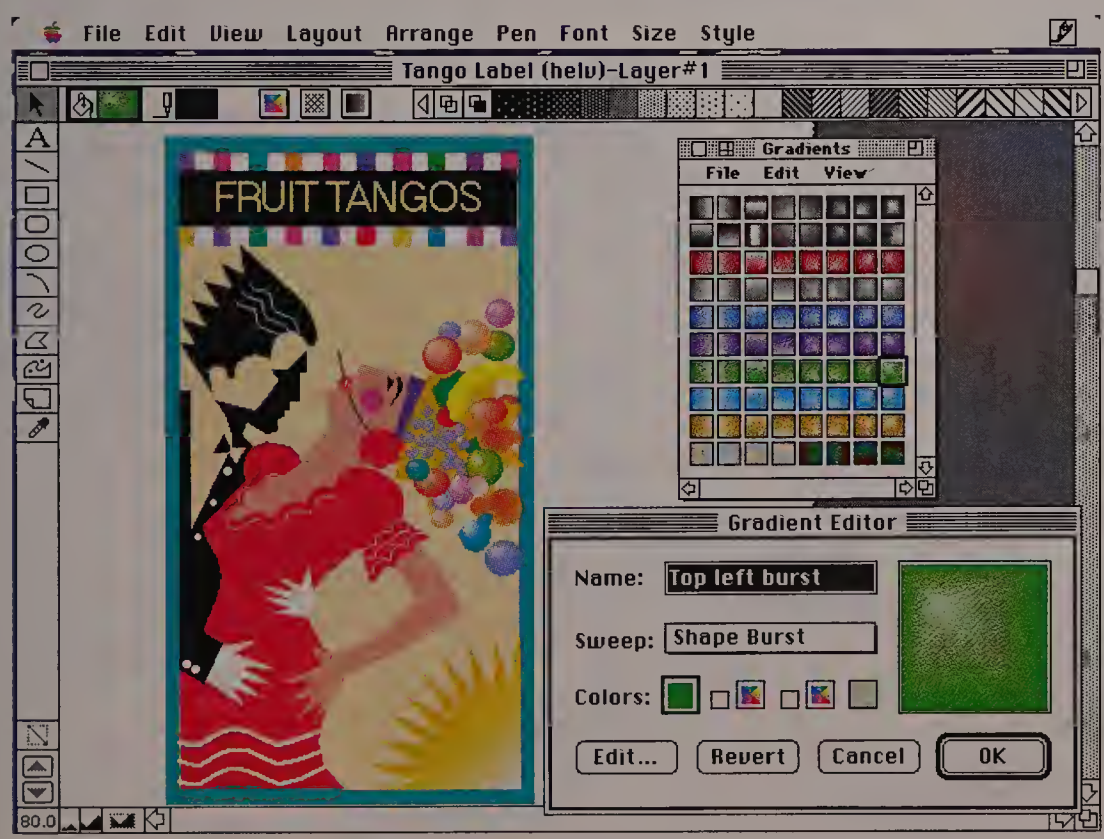
MacDraw Pro's zoom tool works like Claris CAD's so you can select an area which then expands to fill the screen. Other CAD-like features include the ability to move objects from layer to layer, and the ability to stop in the middle of drawing an object to change your tool's parameters or alter another object. Pro has a bezier curve tool that works by dragging directly on curves, without handles.

MacDraw Pro also leaves the 8-color ghetto behind for 32-bit color, Pantone support, and color gradients that can have up to four different colors or highlights. You can control the direction of gradients as well as the shapes and positions of highlights (by dragging them around in a special window), and custom colors or gradients can be named and assigned to an on-screen palette.

MacDraw Pro's price remains $399. For more information, contact Claris in Santa Clara, California, at 408/987-7000.—**D.L.**

New Products for the New Macs

Makers of Macintosh add-ons are practically falling over each other in their haste to introduce products that are compatible with the new Classic, LC, and IIsi.



With new tools for color, text, and drawing, MacDraw Pro walks a winding line between CAD, illustration, and page design.

VIRUS WATCH

Current viruses, Trojan horses, and worms affecting the Macintosh community

MDEF C
Type: Virus
First listed in Virus Watch: 2/91
Info: a Garfield strain; infects applications and system files
Impact: nondestructive; can cause crashes

prod
Type: Virus
First listed in Virus Watch: 2/91
Info: an nVIR B clone; infects applications and system files
Impact: nondestructive; can cause crashes

ANTI-B (aka ANTI-ange)
Type: Virus
First listed in Virus Watch: 1/91
Info: a buggy predecessor of the original ANTI virus; infects applications
Impact: nondestructive; can cause crashes

Dove Computer Corporation announced its MaraThon 030 Classic, a 16MHz 68030 processor upgrade for the Mac Classic. Dove is including virtual-memory software from Connectix and Symantec's SAM 2.0 antiviral and SUM II disk utilities. The MaraThon 030 Classic was slated to ship January 1 at a list price of $799. For more information, contact Dove in Wilmington, North Carolina, at 919/763-7918 or 800/622-7627.

RasterOps announced the availability of five display products for the Mac LC. The 8LC Display Board is a 256-color adapter that supports a 19-inch monitor. It lists for $995. The 8LC Display System is the same board bundled with a 19-inch color monitor with a resolution of 1024 by 768 and a 75Hz refresh rate. Its list price is $3795. The ClearVue/GLSC Display System is a 19-inch gray-scale monitor and adapter for the LC. It has the same resolution and refresh rate and lists for $2195. The ClearView/LC Mono-

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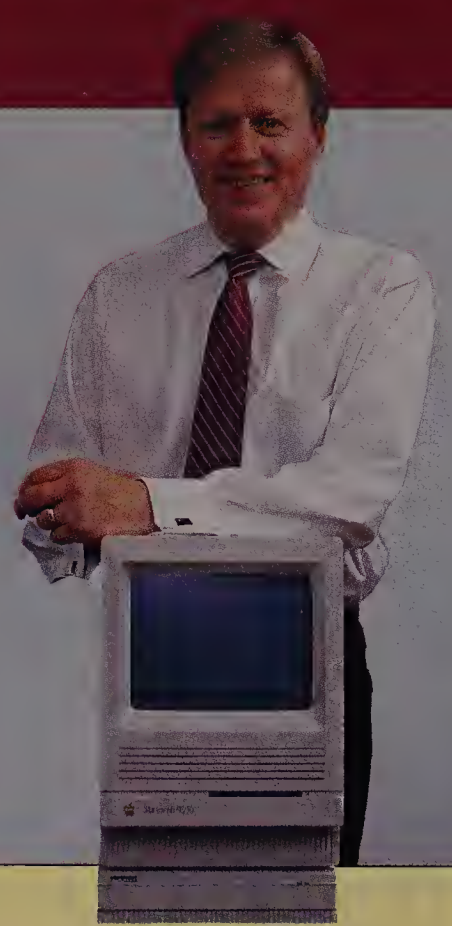

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Ronald Eibensteiner, President/CEO

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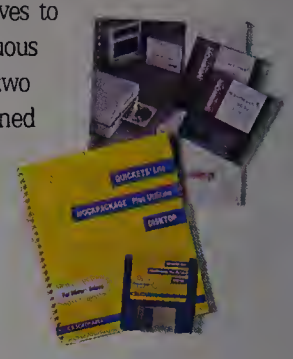

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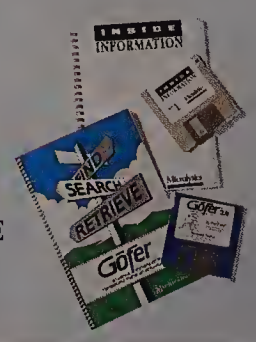
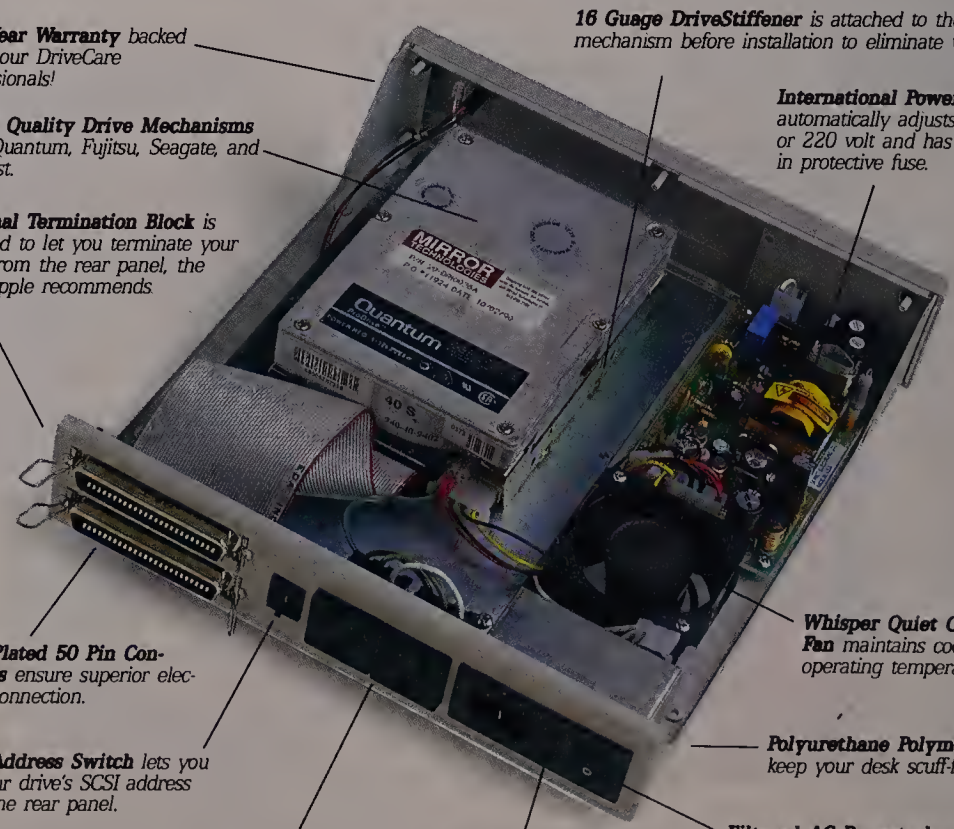


The Anatomy Of A Truly Great Drive.



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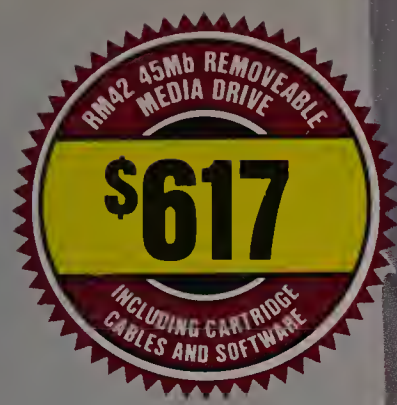

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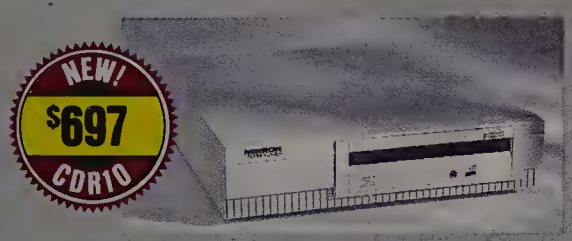

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M40(q)	40Mb	$367	$ 447
M45(s)	45Mb	$327	$ 397
M45(f)	45Mb	$357	$ 427
M80(s)	80Mb	$427	$ 467
M80(q)	80Mb	$587	$ 637
M90(f)	90Mb	$497	$ 547
M105(q)	105Mb	$637	$ 687
M130(f)	130Mb	$647	$ 747
M180(f)	180Mb	$767	$ 877
M290(s)	290Mb		$ 1647
M325(f)	325Mb		$ 1797
M595(s)	595Mb		$2247
M650(f)	650Mb		$2297
RM42	45Mb		$ 617

(s) = Seagate, (f) = Fujitsu, (q) = Quantum

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chrome Display Board is a graphics adapter that works with Apple's Portrait Display at a resolution of 640 by 870. It lists for $695. The ClearView/LC Monochrome Display System, also for the LC, includes a 19-inch monochrome monitor and display board. It has 1024 by 768 resolution, a 75Hz refresh rate, and a list price of $1795. For more information, contact RasterOps in Santa Clara, California, at 408/562-4200.

Radius rolled out display boards that allow the Radius Pivot rotating monitor and the Radius Two Page Display to run with the IIsi. The Radius Pivot IIsi Interface and the Radius Two Page Display IIsi Interface list for $695 and $595 respectively. The Pivot interface includes an 030 Direct Slot Adapter board. Both display adapters are shipping now. For more information contact Radius in San Jose, California, at 408/434-1010.

Sigma Designs has begun shipping the PageView GS, a 15-inch portrait gray-scale monitor that works with the IIsi and the IIci. The company said that it has begun including VLF-reducing circuitry in all its monochrome and gray-scale monitors as a standard feature (very-low-frequency electromagnetic fields are a suspected health hazard). The PageView GS has a resolution of 640 by 870 pixels, a 75Hz refresh rate, and it lists for $899.

MARK JOHANN

MicroNet's 40MB hard drives for the new Macs: from the left, the IIsi/lc-40p internal drive for the IIsi and LC, the MCi-40 for the Classic, and the CPK-40p external drive.

For more information, contact Sigma Designs in Fremont, California, at 415/770-0100.

MicroNet Technology announced 45 storage devices for the Classic, LC, and IIsi. The drives start at 20MB and go up to 2.022GB. The 40MB drive lists for $695, while an 80MB device lists for $995. For more information, call MicroNet in Irvine, California, at 714/837-6033.

Microtech International announced the Io-3, a 3MB RAM board for the Classic that lists for $299. The Io-1 is the same board with 1MB of RAM, upgradable to 1.5MB or to 3MB. The Io-1 lists for $179. Microtech also announced Classic-compatible versions of its Europa line of internal drives, with capacities ranging from 20.5MB to 101.1MB. List prices of the new drives range from $409 to $929. The RAM boards and drives are all currently available. For more information, contact Microtech International in East Haven, Connecticut, at 203/468-6223.

Storage Dimensions announced two 1-inch-high internal hard drives for the new Macs. The 40MB and 80MB drives have 19ms access times and will retail for $759 and $1059, respectively. Both are now shipping. For more information, contact Storage Dimensions in San Jose, California, at 408/879-0300.

MARK JOHANN

Dove's MaraThon 030 Classic is a 16MHz 68030 accelerator for the Mac Classic.

MegaGraphics announced a Macintosh LC version of its two-page monochrome. Called the 4001 Rival, the 19-inch monitor lists for $1698 including the display adapter. The graphics subsystem is available in two versions; the first version runs directly from the LC slot, the second version includes an adapter with a 68882 math coprocessor and a PMMU for compatibility with System 7.0 when the new system software ships. The second version will have a slightly different name and its price was not set at press time. For more information, contact MegaGraphics in Camarillo, California, at 805/484-3799 or 800/487-6342.—**T.M.**

(continues)

MARK JOHANN

Sigma Design's 15-inch PageView GS is a portrait gray-scale monitor that works with the IIsi and the IIci.

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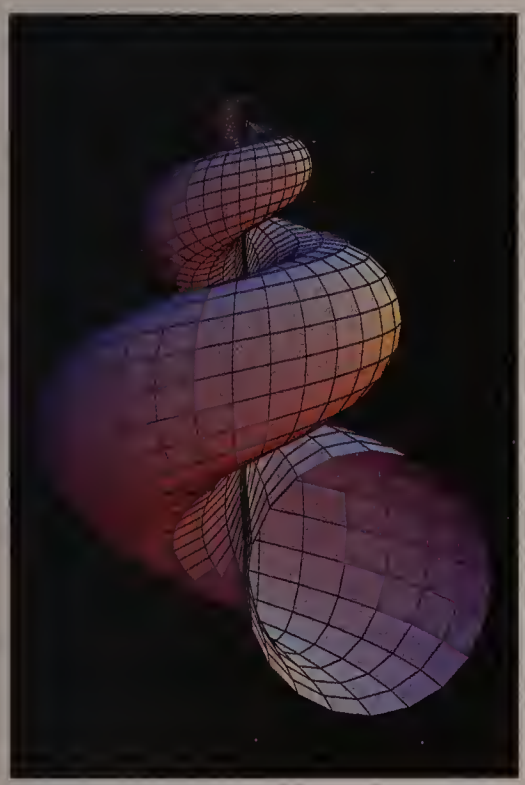
The New Mathematica

Version 2.0 of Mathematica is getting features that will make it more versatile and more useful for engineering and applied research, as well as for publishing math books and articles.

Much of the upgrade builds on Mathematica's existing strengths. "Of the 843 built-in functions in the program, 284 are new," notes Wolfram Research president Stephen Wolfram. "But besides this, we now have a very fast solver for ordinary differential equations, and our linear algebra routines can compete favorably with MatLab in speed." Wolfram claims symbolic-computation speed has been increased 10- or 20-fold, with a built-in expression compiler that automatically generates internal pseudocode from user expressions. For those who use Mathematica as their primary programming language, debugging in Mathematica 2.0 is greatly enhanced (it can trace all types of operations through a program's execution history).



S. DICKSON

Seashell geometry: an upright conical spiral created in Mathematica 2.0.

The Mac version of Mathematica 2.0 features sound input and output—you can manipulate digitized sounds mathematically or generate sounds from Mathematica's vast function set. Besides producing eerie sound effects, this facility has practical applications in speech analysis, filter design, and many special problems in physics.

Mathematica 2.0 graphics are faster, easier to use, and more extensive, with research journal–quality basics such as borders, tick marks, insets, and labeling; for books, magazines, and presentations, the program can now plot 3-D specular (reflective) surfaces, displaying shiny baubles spinning in space.

Document handling in Mathematica notebooks has been expanded to accommodate large documents, textbook typographic conventions, and real-world color printing (for example, the program converts RGB to CMYK). Addison-Wesley is publishing *Exploring Mathematics with Mathematica,* a book written by Jerry Glynn and Theodore Gray and produced entirely in Mathematica (Gray designed the interface for the Macintosh version of Mathematica).

The standard version of Mathematica 2.0 for the Macintosh will list for $595 ($139 for students); a version that takes advantage of a math coprocessor will go for $895. Wolfram is also writing a new edition of his companion book, which will cost $47.50 hardbound and $33.50 paperbound. For more information, contact Wolfram Research in Champaign, Illinois, at 217/398-0700.—**Charles Seiter**

VIRGINIA LIBERATORE

Ilene Fox takes rough notes of a choreography for later conversion to LabanWriter's precise notation.

The Paper Dance

How do you preserve dance? Videotape captures the general feel of the choreography but lacks detail and may record performance errors. Since the 1920s, choreographers and dancers have turned to Labanotation, a complex dance-notation scheme. While this system of symbols and shapes on a three-line vertical staff is accurate, it's also fantastically tedious. "I used to feel like I was a monk, churning out these 300-page dance scores by hand," says Ilene Fox of New York's Dance Notation Bureau.

She doesn't anymore. LabanWriter, developed at Ohio State University's dance department, looks like a cross between a music program and MacDraw. To record a dance on paper, a notator can click Labanotation's 600 symbols (representing body part, speed and direction of movement, intensity, and so on) onto the screen far faster than was ever possible by hand. Fox says that it used to take her a week just to lay out the 3-line staves, which have numbered measures corresponding to the measures in the musical score. Now she can lay out an entire work in three hours.

For a free copy of LabanWriter, write: LabanWriter, Dance Department, Ohio State University, 1813 N. High St., Columbus, OH 43210.
—**David Pogue**

Mirror Cracks the Price of 20-Inch Color

Mirror Technologies has introduced the Mirror ProView Trinitron, a low-cost 20-inch color display system for the Mac. The ProView Trinitron consists of a Sony monitor and an 8-bit graphics adapter board and comes direct from Mirror for $2997, considerably less than similar display subsystems that can carry retail prices over $5000.

The display system produces 256 colors at 1024 by 768 pixels and has a refresh rate of 74.6Hz. The adapter board comes in versions compatible with the Mac II series, the IIsi, and the SE/30. The monitor's screen has an antiglare coating that rotates incident-

(continues)

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Circle 116 on reader service card

JOHN WILLIAM LUND

Mirror Technologies' 20-inch ProView Trinitron has a special antiglare coating on the surface of its screen.

light waves a quarter turn on their way to the glass surface, and another quarter turn when they reflect, with the net effect that many reflected light waves cancel themselves out.

The ProView Trinitron is bundled with VideoPaint, color painting and editing software from Olduvai. The monitor also comes with utilities that provide pop-up menus, a screen saver, and the ability to enlarge the cursor or the menu bar.

The Mirror ProView Trinitron began shipping last November. The $2997 tag on the ProView Trinitron is a firm price, since the company sells direct only and not through discounters. For more information, contact Mirror Technologies in Roseville, Minnesota, at 612/633-4450 or 800/654-5294.—**T.M.**

Look Ma, No Gloves

Imagine entering a computer-generated world and interacting with what you find there. This technology, often called virtual reality, is being applied in many ways. In architecture it lets clients stroll through a building months before construction begins; in war, it won't be long before helicopters fly through forests strafing the ground, controlled by pilots sitting at simulated helicopter cockpits in underground bunkers; in society, it may not be much longer before you can trade your view of the world with a friend.

Vivid Effects has developed a unique approach to virtual reality. The company's Mandala system currently runs on an Amiga stuffed with three custom video boards; a live video camera stacked on top of a big monitor puts your image right into the reality. For example, in one Mandala scene you stand in front of a rock-and-roll band (brought in from a laser disc player). Cartoon drums hang suspended next to your on-screen image, and you can bang along in time with the music. In another Mandala reality, you and a friend rack up points by knocking cartoon balls about inside a life-size pinball machine. And in still another, as you dance you see your body surrounded by colors that swirl and change with your motions. One of the nice things about Mandala is that, unlike most other virtual-reality environments, it doesn't require wearing wired gloves, a body suit, or stereoscopic goggles, leaving you free to move about, and leaving reality designers free to mix the real with the virtual.

Mandala has a full set of authoring tools for designing realities. For the Amiga, the three boards and software run $5900; run-time software and boards cost $3200. Vivid Effects is working on Macintosh software and hardware but has no definite time frame for shipping a product; the company is also considering marketing a $600 software-only system that works with standard Mac video hardware. For more information, contact Vivid Effects in Toronto, Ontario, at 416/340-9290.—**D.L.**

Display Board Supports TV, Compression, Acceleration

MegaGraphics will announce at the January Macworld Expo a multifunction display adapter designed to accept multiple expansion boards with a variety of added features. The NuBus board, unnamed at press time, incorporates its own proprietary bus so that high-performance functions such as real-time video capture can be executed without going through the bottleneck of the NuBus. The basic board is an 8-bit graphics adapter that users can upgrade to 24 bits with a snap-in VRAM module. The board can also accept upgrades for acceleration and JPEG-compatible image compression without expansion boards.

The first true expansion board, which MegaGraphics expects to show at the Expo, will be able to capture real-time video at 30 frames per second and 24 bits per pixel. MegaGraphics said that other companies are developing products that will work with the proprietary bus on the new board, but declined to name the companies or their planned products.

The multifunction board will be

(continues)

WALLY MOSS

Susan Wyshynski pounds on a cartoon drum set with a real band for backup, while Vincent John Vincent looks on.

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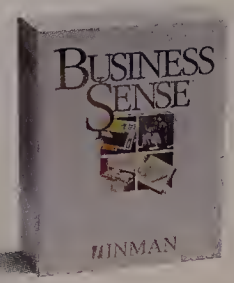

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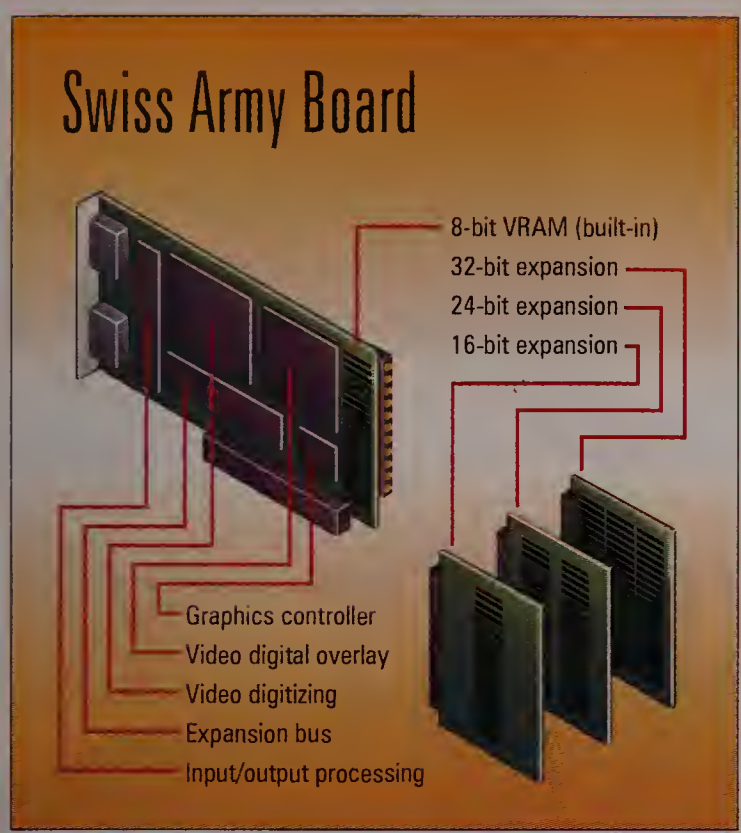


MegaGraphics' multifunction board starts with 8-bit color and upgrades to 24-bit color and a video digitizer.

compatible with the entire Macintosh II line, according to MegaGraphics. It will drive MegaGraphics displays at up to 1024 by 826 resolution, or other vendors' displays at 1024 by 768. The display adapter works with monitors that measure 16 inches to 19 inches diagonally. The company expects to ship the basic board and all of the above options in the first quarter of 1991. Prices had not been set at press time. For more information, contact MegaGraphics in Camarillo, California, at 805/484-3799 or 800/487-6342.—**T.M.**

Kodak Serves Up Color Standard

Eastman Kodak Company has proposed a universal digital-color standard aimed at solving color inconsistency problems. Dubbed PhotoYCC, it's the first color-interchange space (a mathematical expression of color) that addresses not just the Mac but all computers, in addition to the photography, broadcasting, and printing industries. (For more information on color space, see *State of the Mac,* in this issue.)

Each of those environments utilizes a different color-interchange space: RGB for computers, CMYK for printers, NTSC for U.S. television broadcasts, PAL for European TV, and so on. Kodak sees PhotoYCC as the common ground between all those other color spaces; rather than try to make an RGB device use CMYK, all devices use PhotoYCC, which is compatible with all existing standards. As a result, a color image on a Mac would match a laser printout of the same image, but also a slide of the same image, or the image displayed by an IBM PC or a Sun workstation.

Of course, converting a color's representation from one color space to another requires mathematical transforms and calculations. Kodak claims that PhotoYCC has been designed to minimize the number of computations needed to retrieve and display digitized color images.

Kodak plans by year end to publish the PhotoYCC color-interchange specification, which is also compatible with high-definition television (HDTV). So far, it has garnered support from Apple, Adobe Systems, Aldus Corporation, and Next. According to John Warnock, chairman of Adobe, Adobe will provide support for PhotoYCC in all of its PostScript Level 2 devices. IBM, Sun Microsystems, Hewlett-Packard, Autodesk, Microsoft, and Truevision are among other manufacturers pledging support for PhotoYCC. For more information, contact Kodak at 716/724-1630.—**Brita Meng**

Curtis Trackball Adds Foot-Switch Option

The latest in ergonomic design from Curtis Manufacturing is the MVP Mouse, a three-switch trackball that features on-screen configuration and an optional foot-switch. The on-screen configuration is set up from the Custom Control Panel, software that Curtis includes with the trackball. The software lets the user assign any one of dozens of commands to each button. It also can adjust the tracking speed and the double-click speed.

The MVP Foot Switch, which acts as a fourth button, can be used to reduce hand and wrist problems that can result from repetitive motion. The ergonomic layout of the MVP Mouse itself has the three buttons spaced around the far side of the trackball. The device also has a sloping wrist rest to reduce strain.

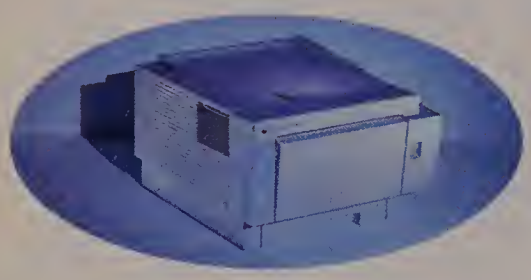
The Curtis MVP Mouse is available now at a suggested retail price of $149.95. The MVP Foot Switch, also available, lists for $29.95. For more information, contact Curtis Manufacturing in Jaffrey, New Hampshire, at 603/532-4123.—**T.M.**

ANN NADLER

The MVP Foot Switch, an ergonomic option for Curtis's MVP Mouse trackball, acts as a fourth switch.

All things being equal, they're not.

They're made by two very good companies. They both have the same great features. Yet, there's one thing that makes NEC's Silentwriter®2 Model 90 look better on paper than the Apple Personal LaserWriter® NT. It's eight hundred dollars less.* Pretty amazing, when you consider how much NEC's



*Apple Personal LaserWriter NT. $3,295***

*NEC Silentwriter2 Model 90 with PostScript. $2,495***

Silentwriter2 has going for it. Of course, it's completely MAC compatible. It also has WYSIWYG screen fonts, 2MB of memory, the ability to do envelopes and the richest blacks you've ever seen. All this and it's MS/DOS compatible and 2PPM faster, too. But most importantly, the Silentwriter comes with Adobe® PostScript®. So whether you're printing newsletters or flyers, sales sheets or shareholders reports, you'll have thirty-five different typefaces to help you create the most dazzling documents possible. For product literature, call 1-800-NEC-INFO. NEC's Silentwriter2 Model 90. Take a close look and you'll find it has no equal.

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**Manufacturers' suggested retail price

PC MAGAZINE EDITORS' CHOICE
November 13, 1990
SilentWriter2 Model 90

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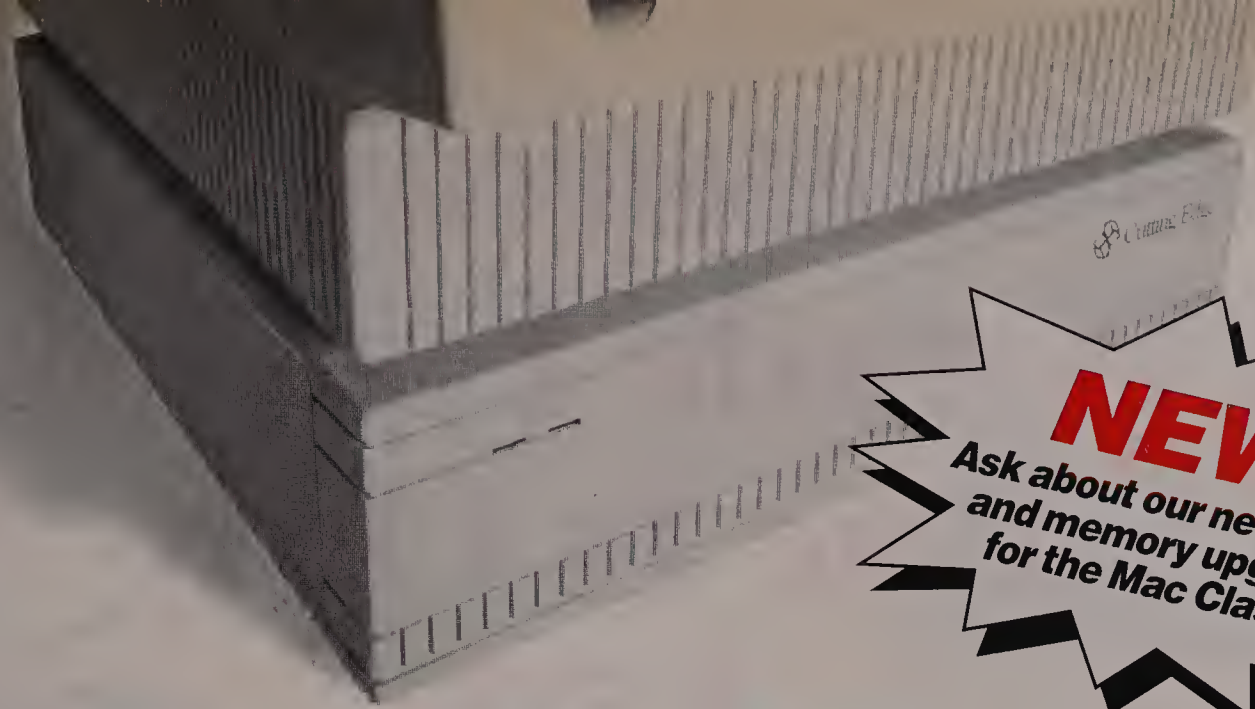

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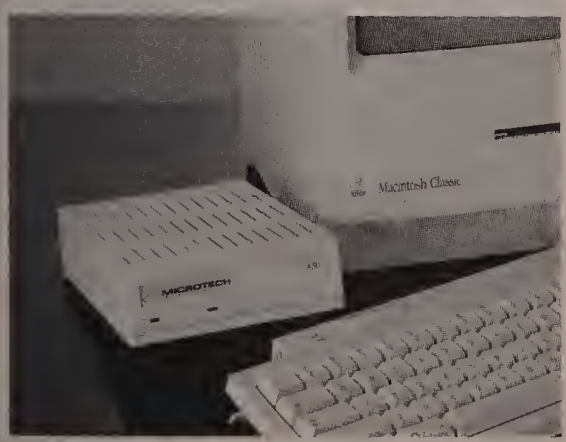

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To upgrade a 4-socket Mac Plus or SE to this amount of memory.	Do this: (Install in multiples of two only)
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2-1/2 MB	Remove only two 256K SIMMs, install two 1 MB SIMMs.
4 MB	Replace all four 256K SIMMs with four 1 MB SIMMs.
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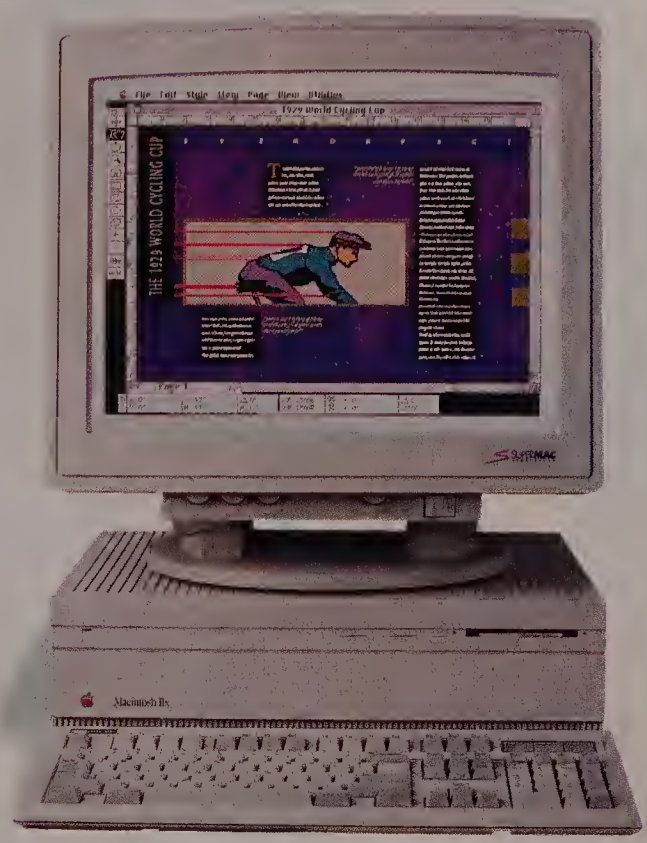

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Let Smart Alarms and Appointment Diary take care of your daily schedule. Just enter your appointments into the diary, and let Smart Alarms remind you of the important events. With the Auto layout function, you can create custom diaries that display information in the format you prefer. New features include automatic backup, a snooze button, the ability to turn off alarms while using specified applications (such as modem software), and a choice of beep options. Multi-User versions are compatible with LocalTalk, MacServe, TOPS, allShare, PSN and Apple Share. (business).
Single User **$64.**
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520 ES UPS ..... 419.
200 DL UPS ..... 159.

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Preformatted Disks DS/DD (box of 10) ..... 14.
Preformatted Disks DS/HD (box of 10) ..... 25.

Basic Needs, Inc. (full line available)
Dust Covers - Grey Nylon Ripstop
Mac II and extd. keyboard ..... 12.
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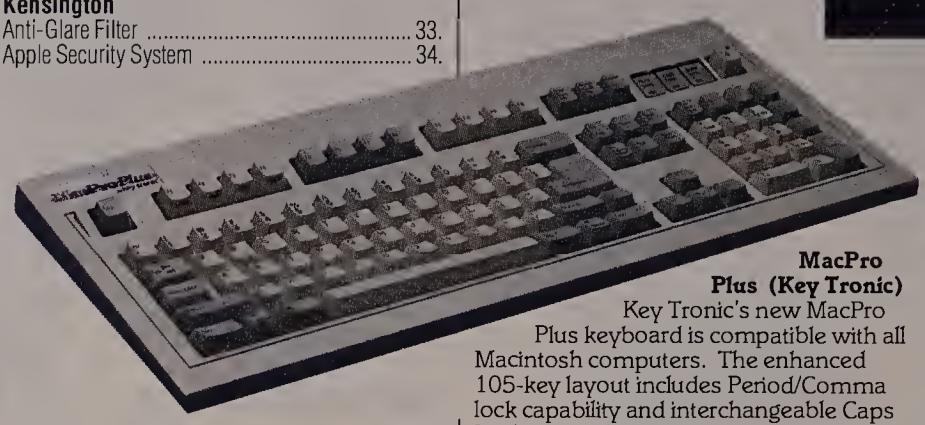
Curtis
Command Center ..... Special 89.

Ergotron
MacTilt-SE/Plus ..... 68.
MacTilt II-RGB ..... 75.

I/O Design
Imageware II Carrying Case ..... 49.
Macinware IIcx Carrying Case ..... 85.
Macinware Mac II Carrying Case ..... 99.
Macinware SE Carrying Case ..... 75.
Monitorware Apple RGB Case ..... 79.
The Ultimate SE Carrying Case ..... 79.
The Neon Ultimate Carrying Case ..... 89.

Kensington
Anti-Glare Filter ..... 33.
Apple Security System ..... 34.



MacPro Plus (Key Tronic)
Key Tronic's new MacPro Plus keyboard is compatible with all Macintosh computers. The enhanced 105-key layout includes Period/Comma lock capability and interchangeable Caps Lock and Ctrl keys. Also, the connecting cable you need is offered at no extra charge. The keyboard is backed by a three-year warranty and unlimited toll-free product support. Includes offer for Tempo II, a keyboard macro package from Affinity Microsystems, a $149.95 value FREE! (input/output). **$118.**

Maccessories SE Anti-Glare Filter ..... 52.
MasterPiece Mac II ..... 105.
PowerBacker 360 UPS ..... 219.
PowerBacker 800 ..... 619.
PowerBacker 1200 ..... 819.
System Saver Mac ..... 63.

Mobius Products
Fanny Mac QT ..... 55.
SE Silencer ..... 39.

Power User
Power User Carrying Case ..... 69.

Sony
DS/DD (box of 10) ..... 13.
DS/HD (1.44 mb) ..... 24.

Targus, Ltd.
Deluxe Plus/SE-XKB Case (black) ..... 69.
ImageWriter II Case (black) ..... 45.
Mac Plus/SE Case (black) ..... 55.
MAc Classic with XKB Case ..... 69.
IIcx/IIci Case ..... 75.
Premier Leather Case ..... 175.

Computer Associates
ACCPAC Bedford Simply Accounting1.1 ..... 225.

Intuit
Quicken 1.5 ..... 35.

Peachtree/Layered, Inc.
at Once! ..... 285.

MECA
Managing Your Money ..... 135.

Nolo Press
For The Record 2.0 ..... 31.
WillMaker 4.0 ..... 37.

Reality Technologies
Wealthbuilder ..... 145.

Softsync/BLOC Inc.
Accountant, Inc. Professional ..... 345.

Softview
MacInTax 1990 ..... 59.
State supplements available ..... Call.

TeleWare
M.Y.O.B. 2.0 ..... 145.

BUSINESS & PRESENTATION

AEC Management Systems
FastTrack Schedule 1.5 ..... 139.

CasinoMaster (Plus/SE) & Deluxe Mac II Version (Centron Software)
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Ultimate Payroll ..... 189.

Absolute Solutions
Computerized Classic Accounting ..... 225.

Checkfree Technology
Checkfree ..... 15.

The "ULTIMATE" SE Carrying Case (I/O Design, Inc.)
The "ULTIMATE" SE Carrying Case is designed with the same high quality standards as other MacLuggage products. This case offers internal, padded compartments for ANY Macintosh keyboard, mouse, external hard disk and cables also holds the new Mactintosh Classic. Features 2 additional exterior pockets for everything from disks to umbrellas. Combine these features with sturdy Dupont Cordura nylon and 1/2 inch high density foam padding and you'll see why this is the "Ultimate" carrying case for your Mac. Available in black and navy blue. (accessories). **$79.**

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AM Software
mart Alarms & Appt. Diary ..... 64.
mart Alarms (1 - 4 users) ..... 125.
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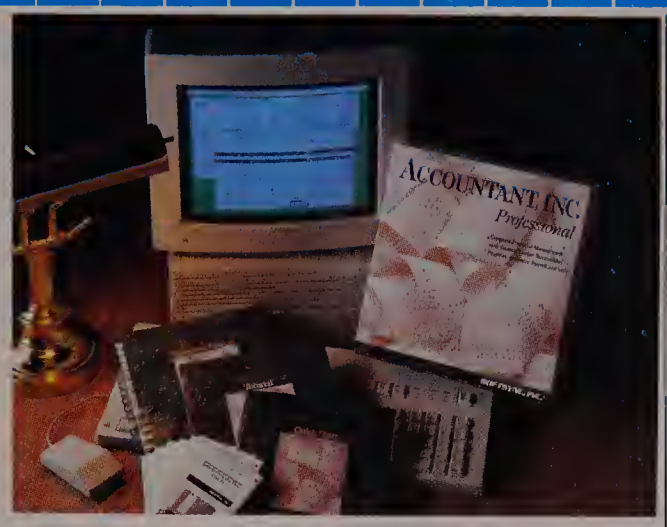

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FastLabel 2.0, FastEnvelope or FastCat ..... ea. 45.
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DESK ..... 229.

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MacDraft 2.0 ..... 193.

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CompuServe Subscription Kit ..... 23.
DataVIZ
MacLink Plus w/PC 4.5 ..... 117.
MacLink Plus/Translators ..... 99.
Farallon™
PhoneNET® Plus, SE & II ..... 35.
PhoneNET® Plus, SE & II 10 pack ..... 219.
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Soft PC 1.3 (Mac II) ..... 245.
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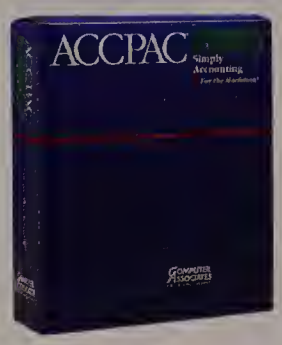
AEC Management Systems
AEC Information Manager ..... 409.
Ashton-Tate
dBase Mac ..... Special 59.
Claris
FileMaker Pro ..... New 218.
Fox Software
FoxBASE+/Mac 2.0 ..... 292.
Preferred Publishers
DAtabase 1.5 ..... 68.

TelePort
TelePort, a 2400 baud MNP5 compatible ADB modem, is the perfect choice for powerful yet compact Mac communication. It packs Hayes compatibility as well as error free communication. Operating at speeds up to 4800 bps it plugs into an affordable desktop/port freeing unit not much bigger than your mouse. TelePort is fully auto bauding and requires no external power supply. **$129.**



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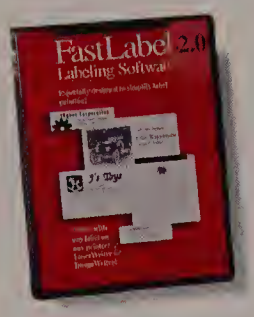
Take control and manage your business more effectively. Includes general ledger, accounts payable and receivable inventory and invoicing, job costing and payroll. Print income statements and balance sheets, or create journal summaries that list transaction detail for the current fiscal year. **$225.**



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HyperGlot Language Software teaches you how to speak Spanish like a native. Features include vocabulary building drills to learn basic words, verb usage and digitized pronunciation guides. Also available in Chinese, French, German, Japanese and Russian. **$35.**

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Read-It! Personal 2.0 ..... 169.
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QuarkStyle ..... 189.
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TimeWorks
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ResumExpert (Word 3.0/4.0 version) (A Lasting Impression)
Whether you're seeking an entry-level position or an executive's corner office, the ResumExpert Software Series is the next best thing to knowing the boss. Professionally written and fully-formatted Microsoft Word templates let you easily create eye-catching resumes. MacUser 10/89 awarded ResumExpert 4 mice and raved about the "excellent manual" that includes expert writing tips. MacUser 12/89 rated it as one of the Top 200 software Programs of 1989. See line listing for all 10 editions. (business). **$49.00 ea.**

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Nova 80+ MB ..... 745.
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Peripheral Land, Inc.
Infinity Dual 40 Meg Turbo ..... 1875.
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RasterOps Colorboard 264 ..... 659.

DataPak Removable Cartridge Hard Disk Drives (Mass Microsystems)
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Personal Training for the Mac, Excel 2.2, FileMaker II, Freehand 2.0, HyperCard, Illustrator 88, PageMaker 4.0, Persuasion 2.0, Quark 3.0, Works 2.0, or Word 4.0 ..... ea. 52.

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Kennect Technology
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DataPak Removeable Cartridge Hard Disk Drives ..... 799.
Micron Technology
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Xceed IICi-128 Cache Card ..... 379.
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Europa 20+ MB ..... 379.
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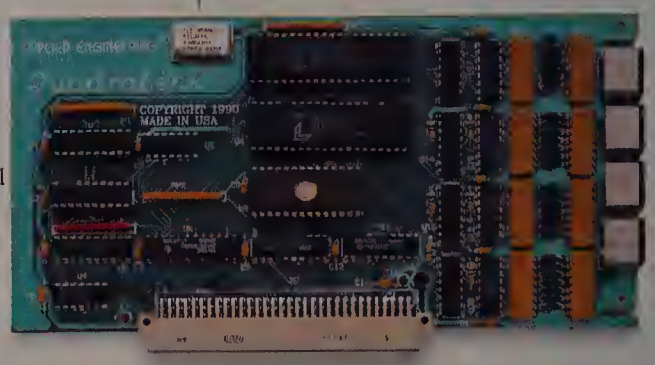
Europa 80+ MB ..... 599.

AE HD Mac Drive & QuadraLink (Applied Engineering)



QuadraLink
QuadraLink solves the problem of clogged serial ports. Add four additional serial devices (printers, plotters, scanners, modems, etc.) to your Mac II. QuadraLink is compatible with Mac's Communication Toolbox, System 7.0 and includes a "shadow driver" to recognize older software. (Mac II family only) (input). **$215.**

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Timbuktu/Remote 2.0 (Farallon)™
Timbuktu/Remote 2.0 enables you to remotely connect your Mac to another Mac to control, observe, send or exchange files over telephone lines or ISDN links. Observe the remote Mac's screen in a window on your Mac's desktop. Additional security features include a unique privilege password protection scheme and security call-back. Timbuktu/Remote 2.0 now supports CCL modem control language for user with non-Hayes compatible modems. (networking). **$123.**

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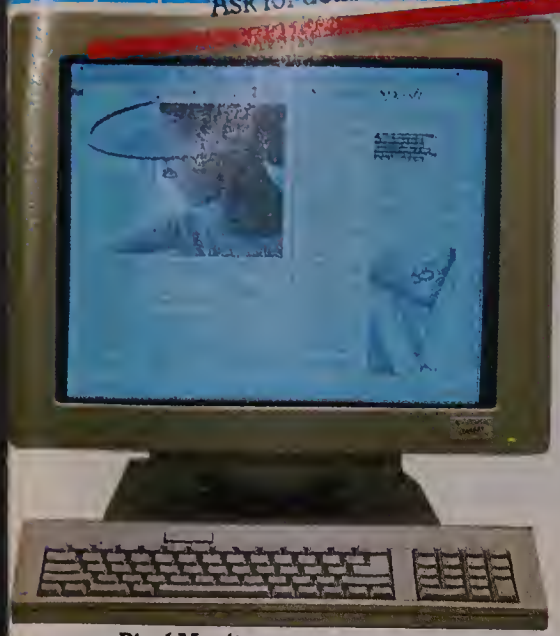

Rival Monitors (MegaGraphics Display System)
MegaGraphics Large Screen Monitor Systems include both the interface card and the monitor. Choose monochrome, gray scale, 8 or 24-bit color. All monitors include an ergonomically designed tilt/swivel stand. The systems operate at a high refresh rate (69 to 75 Hz) to deliver a stable, flicker-free image, with a 75 dpi resolution (1024 X 826 pixels). All come with the manufacturer's one-year warranty (extended warranties available through the manufacturer at extra cost). (hardware). Starting at **$1269**.

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BlackJack Ace or CrapsMaster ..... ea.27.
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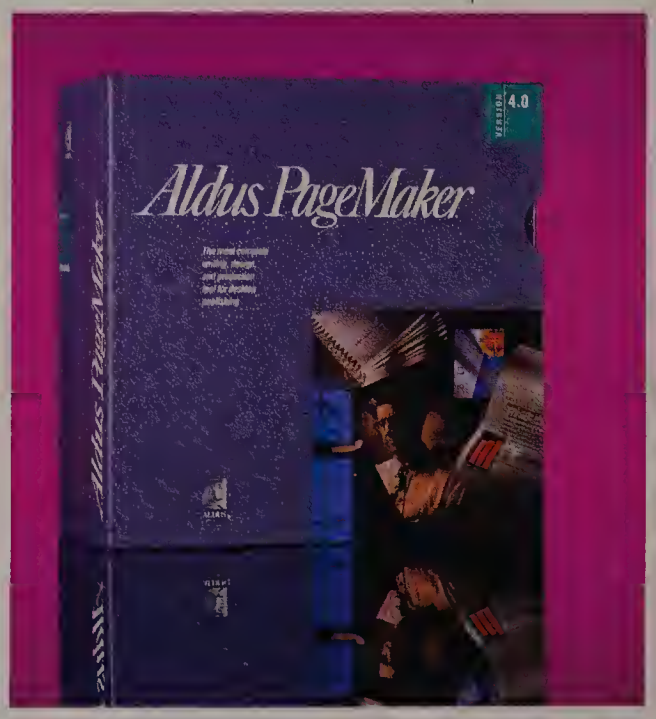
Nemisis Deluxe ..... 99.
Visionary Software
Synchronicity 2.5 ..... 49.
XOR
MacGolf Classic ..... 52.
MacSki ..... 40.
NFL Challenge ..... 55.
Road Race ..... 39.

MacProof 3.2.1 (Lexpertise)
MacProof 3.2.1 is your English proofreader. Without leaving your document, it proofreads all text written on your word processor: business, educational, personal and professional. MacProof is a desk accessory for the Macintosh Plus, SE, II and IIcx. It checks mechanics, word usage, writing style and structure. You can customize the usage and spelling dictionaries to your specific requirements. Compatible with MacWrite II V. 1.0, MacWrite V. 4.6 & 5.0, Microsoft Word 4.0, PageMaker 3.0/3.01/3.02, w/2mg memory, MindWrite V.1 and V.2. (spelling). **$115.**



Aldus PageMaker 4.0 (Aldus)
Aldus PageMaker 4.0 is a complete writing, design and production tool to create professional-looking, high-quality publications. Version 4.0 offers 75 new enhancements and features including a new Story Editor with search and replace by characters, fonts, point sizes, or paragraph styles. New typographic controls improve page appearance and you can rotate text in 90 degree increments. Handles book length documents, generates tables of contents and links graphic elements with related text and MUCH MORE!. (desktop publishing) **$499.**

FONTS

Adobe (full line available)
Adobe Type Manager 2.0 ..... 55.
Adobe Type Reunion ..... 38.
TypeAlign ..... 59.
TypeSet1 or 2 ..... ea. 58.
TypeSet3 ..... 129.
Altsys
Fontagrapher 3.1 ..... 249.
Metamorphosis or The Art Importer 2.0 ..... ea. 85.
Dubl-Click
Menu Fonts 3.0 ..... 28.
Letraset
LetraStudio ..... 275.
Pacific Data Products
MacPage ..... 425.
MacPage PE ..... 459.
Tactic Software
ArtFonts ..... 50.

GRAPHICS/ MULTIMEDIA

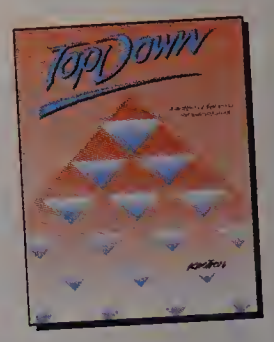
3G Graphics
Graphics & Symbols 1 ..... 50.
Business 1 or Accents & Brdrs 1 ..... ea.65.
Adobe
Illustrator 3.0 w/ATM 2.0 ..... 349.
Photoshop ..... 499.
Smart Art I, II, II, or IV ..... ea. 59.
Streamline ..... 225.
Aldus
Freehand 2.0 ..... 329.
Bright Star Technology
HyperAnimator 1.5.1 ..... 98.
interFACE ..... 249.
Broderbund
TypeStyler 1.5 ..... 119.
Claris
MacDraw II ..... 289.
MacPaint 2.0 ..... 92.
Computer Friends
ColorSnap 32+ ..... 649.
Creative Software
Easy Color Paint 2.0 ..... 47.
Deneba
Canvas 2.1 ..... 189.
Ultra Paint ..... 125.
Digital Vision
Computer Eyes B&W ..... 199.
Computer Eyes Pro Color ..... 349.
Dream Maker
Cliptures, Vol. 1, 2 or 3 ..... ea.69.

Rapport & Drive 2.4 (Kennect Technology)

Rapport
Rapport extends the power of your present internal floppy disk drive and offers new functions when combined with Drive 2.4 or the Apple 800k external drive. Plug it into the external floppy drive port on your Mac and give your internal floppy drive the ability to read 720k MS-DOS disks. **$199.**

Drive 2.4
Allows you to read, write and format 3.5 inch disks in any Mac or DOS standard. Increases the capability of standard (800K) floppies to 1.2 Megabytes and stores as much as 2.4 Megabytes on the new high density disks Together, Drive 2.4 and Rapport give you expanded floppy disk storage—plus MS-DOS connectivity. Comes with Fifth Generation's FastBack II. (drives) **$329.**

LabelWriter
The palm-sized LabelWriter puts anything you can create with your Mac onto a 1"x 3-1/3" thermal label (130 per roll). The exclusive print driver software lets you print directly from your database, word processor and any other application. In vertical or horizontal format. **$185.**



TopDown 2.0
TopDown lets you create great looking flowcharts, organization charts, process flows, documentation sheets and training materials quickly and easily. Instantly write, draw and update your diagrams. Hide or show details in a hierarchy of drawing levels. TopDown's many special features make it powerful yet easy-to-use. **$229.**

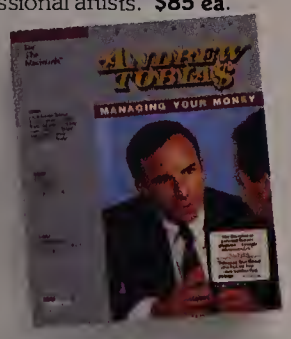
StudyWare Computer Test Preparation Series
Be prepared for SAT's and ACT's with hundreds of review questions and an on-screen glossary. Studyware explains the reasoning behind both the correct and incorrect answers to better understand how test makers think. **$29 ea.**

MacWAREHOUSE™ 1-800-255-6227

MacModem 9600 V.32 (Microcom)
MacModem V.32 uses MNP Class 9 technology for superior throughput up to 38,400 bps even over noisy telephone circuits. The result is high speed, error-free data transfer for reliable cost-saving data communications. Compatible with CCITT V.32, V.22, Bell 212A and 103 modulation standards as well as the Hayes™ AT command set. Includes Carbon Copy Mac Twin-Pac and Quick Link II. (modems). **$689.**

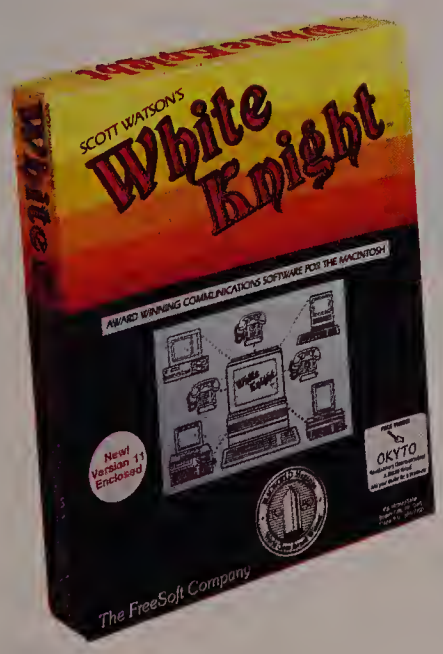
MacPrint 1.2
Lets you print Mac documents on your HP LaserJet or LaserJet IID printer. It handles all the HP internal and cartridge fonts, and prints the others as bitmaps. Cable included. Does not support PostScript. **$95.**

Metro ImageBase
Electronic Clip Art
Add power to your documents with fabulous art images. They make newsletters, presentations, reports and brochures communicate more effectively. Each of the 18 ImageBase packages contains at least 100 topic-related images drawn by professional artists. **$85 ea.**



Managing Your Money for Macintosh 4.0
Contains all of the great tools of 3.0, but a newly designed interface makes it easier to use. For budgeting, checkwriting, portfolio management, net worth calculation and long term planning. Includes, **Checkfree** electronic bill paying service. **$135.**

MacGallery ..... 27.
Electronic Arts
Studio/1 ..... 96.
Studio/8 ..... 189.
Studio/32 ..... 449.
Farallon™
MediaTracks™ ..... 189.
MediaTracks Multimedia pack™ ..... 319.
MediaTracks™ CD ROM ..... 319.
Innovative Data Design
Dreams 1.1 ..... 319.
Letraset
ColorStudio ..... 649.
ImageStudio ..... 139.
MacroMind
MacroMind Director 2.0 ..... 439.



Media Maker ..... Call
Mass Microsystems
QuickImage 24 Video Frame Grabber ..... 749.
Metro ImageBase (full line available)
Art Deco or People ..... ea. 85.
Newsletter Maker or Business ..... ea. 85.
Micro Frontier
Enhance ..... 239.
Multi Ad Services
Multi-Ad Creator ..... 799.
Paracomp
DrawTools ..... 62.
Film Maker ..... 439.
ModelShop 1.1 ..... 375.
Swivel 3D Professional 1.0 ..... 439.
Swivel ART ..... 82.
Silicon Beach
Digital Darkroom 2.0 ..... 259.
Super 3D 2.1 ..... 339.
SuperCard 1.5 ..... 205.
SuperPaint 2.0 ..... 135.
Solutions, Inc.
Curator ..... 87.
SmartScrap & The Clipper 2.01 ..... 56.
Strata
StrataVISION 3d ..... 375.
Strategic Mapping, Inc.
Atlas Map Maker 4.5 ..... 369.
Studiotronics
Colorset 1.5 ..... 229.
SuperMac
PixelPaint 2.0 ..... 225.
PixelPaint Professional 2.0 ..... 465.
Tactic Software
Art Clips Vol. 1 or Vol. 2 ..... Call.
Icon-It! 2.1 ..... 45.
T/Maker
Click Art Business Images ..... 32.
EPS Illustrations ..... 82.
Business Cartoons ..... 33.
Zedcor
DeskPaint 3.0 inc. DeskDraw ..... 115.

HARDWARE & PERIPHERALS

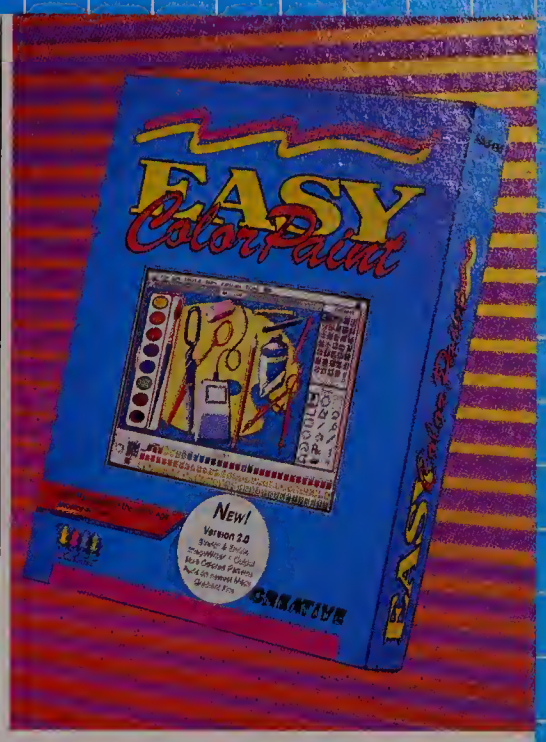
Aapps
DigiVideo B&W ..... 399.
DigiVideo Color ..... 669.
Co Star
Label Writer ..... 185.
Organizer ..... 199.
Hewlett Packard
HP DeskWriter ..... 759.
MegaGraphics Display Systems
Rival 2001 System for Mac II ..... 1269.
Rival 3001 System for Mac SE/30 ..... 1269.
Rival SE System for Mac SE ..... 1269.
19" Color 2008 Hi-Res/Mac II ..... 4459.
16" Color 2008 Hi-Res/Mac II ..... 2679.
Grayscale 2008/Mac II ..... 1879.
Grayscale 3008/Mac SE/30 ..... 1899.
Microtek
Microtek MSF-300GS Scanner ..... 1375.
Microtek MSF-300ZS Scanner ..... 1998.
NEC (Full line available)
Intersect CDR-35 ..... 399.

White Knight V.11 (FreeSoft)
This award winning communications software includes a reworked user interface with completely reorganized menus and enhanced terminal support including support for the VT-102. It supports the new ZModem protocol, as well as more versions of XModem and Kermit. It works properly with MultiFinder and supports both color QuickDraw and large monitors. Get a *free* subscription to GEnie and a *free* copy of Okyto (a revolutionary Mac-to-Mac file transfer program) with each copy of White Knight. (communications/networking). **$85.**

Qume
Crystal Print Publisher 3.02 ..... 2499.
Seikosha America
Seikosha Printer (dot-matrix) ..... 235.
Sharp (full line available)
The Wizard - 7000 ..... 219.
The Wizard 7200 (64K RAM) ..... 255.
ThunderWare
LightningScan 400 ..... 385.
ThunderScan Plus ..... 199.

INPUT/OUTPUT

Applied Engineering
QuadraLink ..... 215.
Basic Needs
Cordless Mouse ..... 95.
Caere
Typist ..... 479.
Calcomp
DrawingBoard Digitizers 12" x 12" ..... 319.
DrawingBoard Digitizers 12" x 18" ..... 609.
DrawingBoard Digitizers 18" x 24" ..... 1359.
WIZ Tablet ..... 159.
WIZ Pen ..... 57.
WIZ Templates ..... 19.
CH Products
Mach IV Plus Mouse/Joystick ..... 51.
CoStar
LabelWriter ..... 185.
DataDesk Intl.
DataDesk Switchboard ..... 159.



Easy Color Paint 2.0 (Creative Software)
With Easy Color Paint, you'll be creating graphics on your Mac in no time! It puts you in control of 17 tools, 256 colors, user-defined multi-colored patterns, gradient fills, multiple color palettes, resizable windows, adjustable fonts and brushes. Also, color inversion and blends, and "wacky coloring." It has bucket and lasso modes to simplify operation, rotation in 90 degree increments and FatBits windows for detailed editing. (graphics). **$47.**

Mac 101 Keyboards ..... 129.
Kensington
New Turbo Mouse ..... 109.
Key Tronic
MacPro Keyboard ..... 118.
Koala
MacVision 3.0 269
Kraft
ADB Joystick Premium III (SE&II) ..... Special 29.
Trackball ..... 79.
MicroSpeed
MacTrac ADB ..... New 75.
MacTrac DB9 ..... 62.

DeltaGraph 1.5 (DeltaPoint)
Creates 25 types of charts and graphs (including seven 3D styles). Use the Data Notebook to import data (up to 10,000 points) in a spreadsheet format and DeltaGraph will create the chart you want. Embellish your graph by importing EPS or PICT files. Or use the drawing tools which include Bezier curves, fill patterns (horizontal, vertical and radial) and full color controls. Lets you print your graphs on either QuickDraw or PostScript printers, plus plotters and film recorders. It's the perfect solution for creating both business and scientific charts. (business). **$109.**

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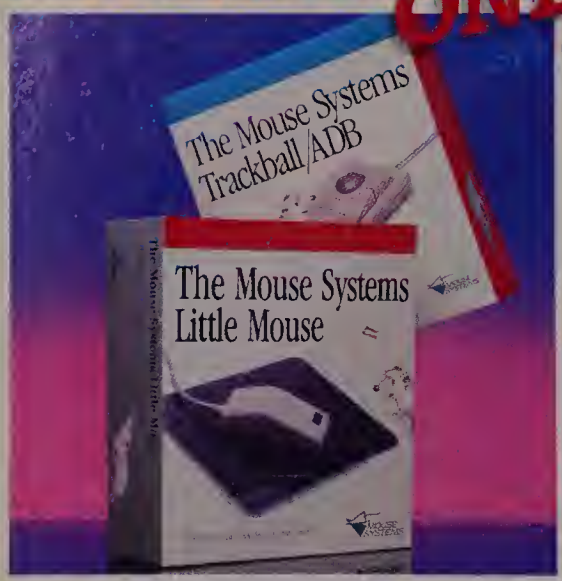
Many of our products come with a thirty day money back guarantee, if you are not completely satisfied. Ask for details when you place your order.



Trackball ADB & Little Mouse 512, Plus (Mouse Systems)
Trackball ADB
Mouse functionality in a fraction of the space. Quickly flip through menus or glide instantly across the screen. Its ergonomic design provides hours of comfort while delivering smooth, accurate, cursor positioning. **$69.**

Little Mouse
Great for graphics, CAD, business and more. Little Mouse is 22% smaller, 38% lighter and provides over 50% more resolution and control than other Apple mouse alternatives. It combines advanced optical technology with the latest CMOS analog/digital chip design to deliver a wonderfully compact and accurate input device. (inpu). **$75.**

Micro Touch
The UnMouse ..... 189.
Mouse Systems
TrackBall ADB ..... 69.
Little Mouse ..... 75.

LANGUAGES

Symantec
THINK'S C 4.0 or Pascal ..... ea. 165.
Zedcor
ZBasic 5.0 ..... 99.

MEMORY UPGRADES/ ACCELERATORS

1 MEG SIMMS
Low Profile, 100ns High Quality
Single In-Line Memory Modules ..... 59.
For MacPortable ..... 435.
For IIfx - 80ns ..... 109.
For LaserWriter II NTX - 80ns ..... 109.
Dove (Full line available)
MacSnap 524E ..... 209.
MacSnap 524S ..... 279.
MacSnap 548S ..... 539.
MaraThon 030 Accelerators ..... 529.
Total Systems
Gemini SE 20 MHZ ..... 1069.
Gemini II SE 25 MHZ ..... 1329.
Gemini II SE 33 MHZ ..... 1685.
Gemini II SE 40 MHZ ..... 1879.
Gemini II SE 50 MHZ ..... 1625.
Gemini II SE 60 MHZ ..... 2269.
Gemini Plus Kit ..... 129.

MODEMS/FAX

Best Data Products
SmartOne 2400/1200 ..... 139.
Dove
DoveFax desktop ..... 299.
Global Village
Teleport ..... 129.
Hayes
Smartmodem 2400 ..... 349.
Smartmodem 9600 (V series) ..... 689.

Microcom
MacModem 9600 v.32 ..... 689.
Power User™
2400 baud modem ..... 99.
24/96 Mini Send Fax ..... 149.
24/96 Send/Receive Fax ..... 279.
Prometheus
2400 MaxFax ..... 309.
2400 MFax ..... 209.
ProModem 2400M ..... 199.
ProModem 2400M II ..... 205.

SmartOne 2400/1200 (Best Data Products)
When you need a 2400 baud modem, the SmartOne 2400/1200 provides an economical alternative. For less than the cost of some 1200 bps units, you get a Hayes compatible modem with auto answer/originate, 300, 1200, and 2400 baud operation, pass-through phone jack, speaker with programmable volume and a manufacturer's two-year warranty. Includes free Quicklink II communications software, modem, cable, and **CompuServe/Prodigy Start-Up Kit** offer. (modems). **$139.**

ProModem 9600 ..... 699.
Travel Modem ..... 205.
Supra
Supra Modem 2400 ..... 119.

MUSIC AND SOUND

Altech
MIDI Interface ..... 59.
Coda
Finale 2.5 ..... 549.
ElectronicArts
Deluxe Music Construction 2.5 ..... 85.
Deluxe Recorder ..... 99.

WIZ & DrawingBoard Digitizers (CalComp)
WIZ - Combines a mouse with a graphics tablet. Mouse glides over a 9.5 by 11.8 inch tablet, sending its position to your Mac with a precision of 1000 dpi. Comes with manufacturer's five-year warranty. Available templates include: Word 4.0, WordPerfect 1.0.2, XPress 2.11, Excel 2.0, Illustrator 88 1.0, FreeHand 2.0, MacWrite II 1.0, MacDraw II 1.1, PageMaker 3.0, Persuasion 2.0, and PowerPoint 2.0. **WIZ tablet $159, Optional templates $19 ea. Optional 2 button pen $57.**

DrawingBoard Digitizers - 2300 A Series Digitizer's provide a large work area for high-precision drawing and drafting. Has a command area with template overlays so you can initiate all software commands directly from the tablet. Includes 16 button mouse with cross-hair cursor. Requires Mac with ADB port. (input/output). **DrawingBoard Digitizers 12x12 $319, 12x18 $609, 18x24 $1359.**

Farallon™
MacRecorder 2.0™(records sound) ..... 159.
Tactic Software
Sound Clips Vol. 1, 2, 3 or 4 ..... ea. 49.

SECURITY & VIRUS PROTECTION

ASD Software, Inc.
FileGuard 2.5 ..... 139.
FileGuard Office 5-pack ..... 349.
FileGuard Office 10-pack ..... 579.
Fifth Generation
Disk Lock ..... 118.
Kensington
Pass Proof ..... 75.
Kent Marsh
MacSafe II ..... 107.
NightWatch ..... 86.
Microcom
Virex ..... 59.
Virex 10-pack ..... 329.
Symantec Corporation
S. A. M. ..... 67.

UTILITIES

Abbott Systems
CanOpener 1.1 ..... 64.
Aladdin Systems Inc.
StuffIt Deluxe ..... 63.
ALSoft
DiskExpress II 2.04 ..... 57.
Master Juggler ..... 64.
Berkeley System
After Dark 2.0 ..... 24.
CE Software
Alarming Events ..... 85.
QuicKeys 2.0 ..... 97.

An $812.95 Value for $215! (Suggested Retail Price - Over $597 Savings!)

SmartBundle (T/Maker)
NEW! A total solution for first-time Macintosh buyers. A collection of four easy-to-use, award-winning applications in one bundle at an incredible price! Includes WriteNow 2.2 for word processing, FullImpact 1.1 for spreadsheet and charting, SuperPaint 2.0 for painting and drawing and RecordHolder+ for database management. Also, includes SmartBundle Launch, a customized version of DT Launch which allows easy access to each application. (business) **$215.**

QuickImage 24 Video Frame Grabber (Mass Microsystems)
Captures 24-bit full-motion color or 8-bit gray scale images. It fits in a single NuBus slot and automatically switches between NTSC and PAL signals. QuickImage saves images as PICT2 files, usable in desktop publishing, presentation, or video projects. Or, you can edit them with your favorite image enhancement software. Includes two inputs and accepts signals from many standard video sources, including VCRs, camcorders, and video disk players. It works with any Mac monitor and display card. (graphics). **$749.**

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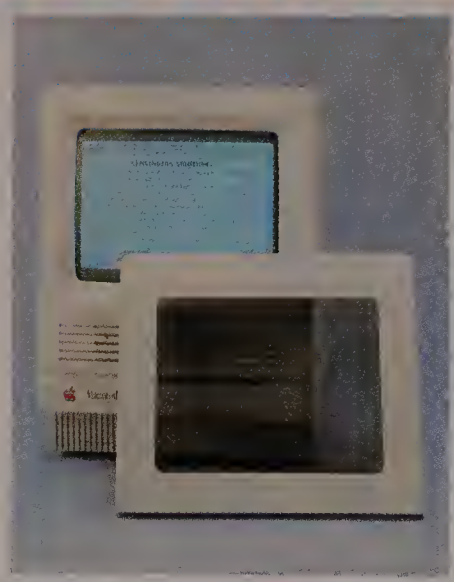
Caere
OmniDraft or OmniSpell ..... ea.69.
OmniPage 3.0 ..... 495.
Central Point Software
Copy II Mac ..... 23.
Mac Tools Deluxe ..... 75.
Custom Applications
Freedom of Press 3.0 ..... 255.
Freedom of Press Light 3.0 ..... 56.
Dantz Development
Retrospect ..... 148.
Dayna Communications
DOS Mounter ..... 55.
DublClick
ClickChange ..... 41.
Fifth Generation
FastBack II ..... 118.
Suitcase II 1.2 ..... 49.
SuperLaserSpool 2.0 (single user) ..... 87.
SuperSpool 5.0 ..... 62.
ICOM Simulations
On Cue ..... 35.
Insight Development
MacPrint 1.2 ..... 95.
Magic Software
AutoSave II ..... 28.
Magna
Empower I ..... 89.
Empower II ..... 155.
Mainstay
Capture 3.0 ..... 45.
MacFlow 3.5 ..... 125.

Now Software
Now Utilities ..... 79.
Preferred Publishers
Personality ..... 53.
Screen Shot 1.2 ..... 31.
Software Innovations
Handoff II ..... 52.
SuperMac
DiskFit 2.0 ..... 58.
Tele Typesetting Co.
TScript v. 1.3 ..... 92.

WORD PROCESSORS/ SPELLING CHECKERS

Ashton Tate
FullWrite Professional 1.5 ..... Special 149.
Claris
MacWrite II ..... 142.
Deneba Software
BigThesaurus ..... 64.
Spelling Coach Pro 3.1 124
Lexpertise
MacProof 3.2.1 ..... 115.

FileGuard 2.5 (ASD)
"FileGuard stands out, especially for corporate users." *MacUser* May, 1990 Issue.
Protect your Hard drives and Partitions from unauthorized access (including security bypass with a system diskette), copying and erasure; Applications and Files/ Folders (including system folder) from unauthorized access, deletion, and/or illegal copying; Desktop (including system folder) from alterations by unauthorized users; Keep an eye on System Usage with the system users log which continuously tracks user/group activity. (security). **$139**. Office 5 Pack **$349**. Office 10 Pack **$579**.



Maccessories SE Anti-Glare Filter (Kensington)
The Maccessories SE Anti-Glare Filter from Kensington has a ceramic coating that reduces glare up to 96 percent and improves contrast up to 20 percent. Kensington has added protection to reduce the ELF and VLF electromagnetic energy passing through the SE screen. Also, a special conductive coating and a ground wire dissipate static electricity, keeping dust from building up to the screen. (accessories). **$52.**

Planisoft (ASD)
Planisoft increases workplace productivity through detailed management of time and resources. Use its intuitive user interface and powerful relational database to simultaneously manage and record activity concerning hundreds of people, events, materials and locations. Coordinate individual and group agendas, find available time slots for appointments, keep track of deadlines and priorities, distribute tasks evenly, optimize resources and share information between Macs and PCs over any LAN. Everything is kept confidential through multi-level password protection. (business). **$199**. Office 5 pack **$579**. Office 10 pack **$839**.

LifeTree
Correct Grammar ..... 49.
Microlytics
Word Finder 2.0 ..... 34.
Microsoft
Word 4.0 ..... 245.
Preferred Publishers
Vantage 1.5 ..... 52.
Tactic
Magic Typist ..... 49.
T/Maker
WriteNow 2.2 ..... Special 119.
WordPerfect Corp.
WordPerfect ..... Call.

Circle 78 on reader service card

STOP PRESS

Cutting Edge Hard Disk Drives (Cutting Edge)
New enhanced Cutting Edge drives deliver quiet, reliable memory with access times as low as 20ns. New features include two power outlet, 50-pin cables for easier daisy chaining, a quieter fan, dual-fuse surge buffer and simplified operation manuals. Available in 20 MB to 80 MB. **20MB Only $339, 30+MB Only $399, 40+MB Only $449, 60+MB Only $489, 80+MB Only $539.**

45MB Removable
The enhanced 45MB Removable is based on the same award winning SyQuest mechanism that other leading makers offer at twice the price. Exchangeable cartridges provide unlimited storage. (drives). **45MB Removable: $699.**

Power User™ 2400 baud Modem
Install a new Power User 2400 baud modem and log-on to CompuServe™ or any of the exciting on-line services! This new, full-featured modem comes complete with everything you need to start communicating. It's easy to install and ready to use - all cables and MAc-KNOWLEDGE communication software are included. It also has all the features you need in a modem, including Auto Answer, Auto Dial and Advanced Diagnostics for error checking. **Only $99.**

Power User™ 24/96 Mini Send Fax
New! Send Important documents to destination fax machines with the Mini Send Fax. Mini Send Fax combines the technologies of the Power User 2400 bps data modem and an internationally compatible 9600 bps, Group III fax. **Just $149.**

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A FEATURE-BY-FEATURE FACE-OFF BETWEEN ALDUS PAGEMAKER AND QUARKXPRESS

Page Wars

You hear the question everywhere in the Mac page-makeup world these days—on the online services, during panel discussions, and in computer stores, service bureaus, and hip downtown bars: "Which one should I buy, Aldus PageMaker 4.0 or QuarkXPress 3.0?" Between them, these programs define the standard for powerful, professional page makeup on the Mac.

So which should you buy? The last thing you want to hear me say is "it depends," so I won't. I will say, though, that in their recently upgraded forms both programs are great; designers around the world are using both to produce consummately professional publications. The programs' feature sets vary widely, however, and their working styles are quite different. The goal of this article is to detail those differences and to offer real, concrete judgments about the strengths and weaknesses of both programs so that you can decide which suits you better.

No program works in a vacuum, so I'll be mentioning other software in the course of this comparison—in particular, add-on products such as the $495 Aldus PrePrint separator and the various XTensions that add features to QuarkXPress. The ability to accept extensions is a significant feature in itself. Current offerings for QuarkXPress range from shareware utilities and Quark's Freebies XTension to the $79.95 QuarkXTras package of a dozen add-ons on up to XTensions that cost several thousand dollars each.

My judgments about each program's sections and subsections, as reflected in the subheads of this article, are summarized in "Final Report Card."

BY STEVE ROTH

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WITH QUARK YOU CAN CUT AND PASTE—OR SIMPLY DRAG PAGE ELEMENTS—FROM ONE DOCUMENT TO ANOTHER. THIS IS A REVOLUTION ON THE MACINTOSH THAT BEARS WIDE IMITATION.

Interface

Windows, palettes, tools, and controls Both programs use the metaphor of a pasteboard lying under the pages, which makes it easy to create bleeds in either program. The pasteboards are implemented quite differently, however. Each page in QuarkXPress has its own pasteboard, while PageMaker pages take turns appearing on the publication's single pasteboard. QuarkXPress allows you to drag items between pages, while PageMaker makes items on the pasteboard available from any page or spread.

PageMaker opens only one document at a time, so in order to move page elements between documents, you have to laboriously open, copy, close, open, and paste (though the new story filter lets you view and import whole stories or all the text from other documents).

QuarkXPress can have as many as seven documents open at once, and you can cut and paste—or simply drag page elements—from one document to another. This is a revolution on the Macintosh that bears wide imitation. You can also drag items into a QuarkXPress Library of elements—another impressive innovation, and one of QuarkXPress's best new features. You can save and open multiple Libraries, and you can drag items from the Libraries into other documents or onto other pages.

QuarkXPress also offers a Document Layout palette that makes it easy to rearrange pages, work with master pages, and move from page to page (the advantage of palettes is that they stay accessible on screen at all times, unlike dialog boxes). PageMaker offers a similar method for moving between pages, but it doesn't enable you to rearrange page order.

QuarkXPress's remarkably useful Measurements palette makes effecting local changes in page elements easy. You just select an item and click on the palette, then tab through the shown fields, entering values as in a dialog box, but without having to go through the relatively slow process of getting to a dialog box. Even within QuarkXPress's dialog boxes, you can see changes instantly by turning on Auto-apply, which effects changes as soon as you release the mouse button or tab to the next field.

DAVID BARRY

Intuitive Decision David Dunkelberger, senior V. P. of WYD Design in its Westport, Connecticut, offices. WYD uses both PageMaker and QuarkXPress, but according to Dunkelberger, "In 80 to 90 percent of the instances, we use PageMaker. We came back to it because it thinks like we do."

PageMaker has palettes for applying and editing global settings—colors and styles (which QuarkXPress hides in menus and dialog boxes). All local changes, however, are made via menu items, dialog boxes, and keyboard shortcuts.

Rulers and guides PageMaker's rulers provide greater precision in magnified views. You can specify custom vertical ruler increments (15-point increments with 15-point leading, for instance), and there's a snap-to-ruler feature that you won't find in QuarkXPress.

Both programs let you drag out ruler guides, but QuarkXPress's guides have a big problem: you can't grab them if a page element is in front of them—even if you have the guides set to In Front.

Zooming and scrolling QuarkXPress lets you type in custom zooming percentages and configure the zoom tool for custom increments. Even better, you can drag a magnifying glass tool to select an area to fit in the window. Also, you can zoom out to see several pages at once; in PageMaker you can never see more than two pages at a time.

Even though QuarkXPress has more features than PageMaker, navigating within a page or spread can be a pain in QuarkXPress for two reasons: the Fit in Window command doesn't center the page in the window (often only a corner is visible), and there's no grabber hand for moving the page around. The omission of this little item is probably the program's biggest failing. In QuarkXPress there are "live" scroll bars (watch the page move as you move the scroll bars), but you have to mess with both the vertical and horizontal bars to move diagonally. PageMaker's ability to center the current selection when zooming to any magnification is also a big plus not available in QuarkXPress.

Page Elements

Lines, boxes, ovals, and polygons With QuarkXPress, all text and graphics are contained in boxes that can be simple containers, or graphic elements, or both. Picture "boxes" can also be ovals, or polygons that you can reshape—especially useful for silhouetting scanned images. When you select a box with Quark's Contents tool, the

box becomes opaque, obscuring other elements both in front of it and behind it.

In PageMaker, there are no such containers; text and graphics are independent elements. You create boxes, ovals, and lines separately, and layer them on top of or behind text blocks and imported graphics. The Quark approach lets you do more things, with fewer elements, but the PageMaker approach is simpler, especially for beginners.

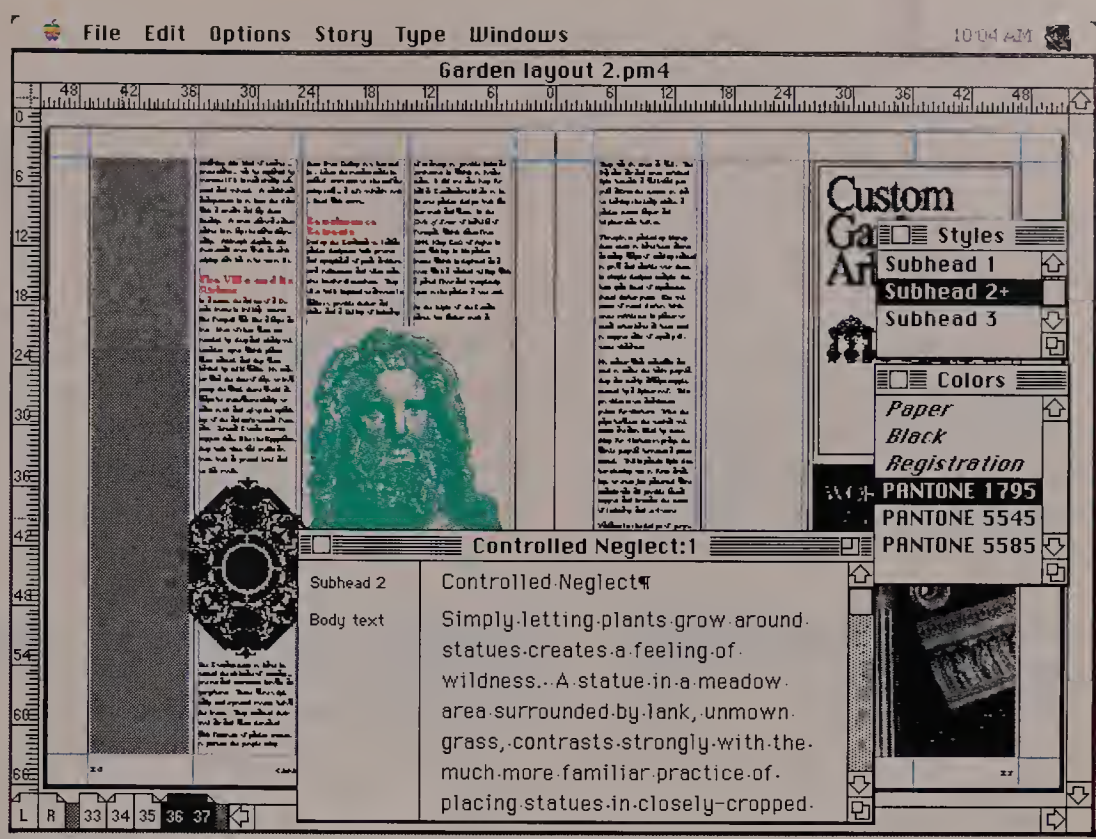
Line weights, fills, and tints PageMaker limits you to several canned line weights and percentage tints, and you can't apply a percentage tint to lines or type, except by defining colors such as "13 percent black" (this works fine unless you're doing spot-color work). QuarkXPress lets you set line weights, fills, tints, and colors in any combination.

Selecting, moving, and scaling Selecting is pretty predictable in these programs, but PageMaker has one big plus: you can select items that are in back of other items by using ⌘-click. QuarkXPress makes you do a lot of layer shuffling.

PageMaker is better for manual repositioning; you can see items as you move and scale them (Quark just shows you their bounding boxes), and you can position items using the snap-to-ruler feature mentioned above.

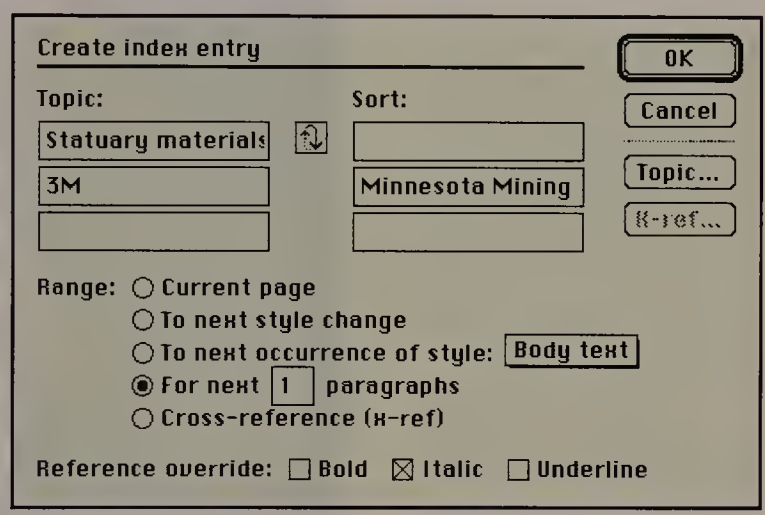
QuarkXPress, on the other hand, offers numerical positioning that PageMaker users only dream of. You can nudge items in increments as small as .1 point and even add to and subtract from existing specs: if the *y*-axis position for an item reads 4", type +2 after it (4"+2) and the item moves down 2 inches. You can also scale graphics by percentage—a feature glaringly absent from PageMaker.

Grouping, alignment, and distribution PageMaker lets you group items only through a clumsy place-the-Scrapbook workaround. QuarkXPress lets you group items, and you can scale and position those items within the group. You can't scale the whole group, however. QuarkXPress also provides alignment (top, middle, bottom, left, center, right) and distribution controls (positioning several items a given distance apart), both of which PageMaker lacks.



Pages and Palettes PageMaker's color and style palettes make it easy to change and apply those attributes to page elements. The story editor allows you to edit quickly and easily without worrying about the layout. While you are editing in story view, the story is grayed out in layout view. When you close the story window, the changes automatically appear in the layout.

PageMaker's Option-paste technique pastes a copy of an object directly on top of the original and also provides for easy, drag-then-do-it-again step-and-repeat duplication. QuarkXPress has an explicit step-and-repeat command that lets you specify the number of copies and their offsets—it's faster but less interactive.



In-depth Indexing The Create Index Entry dialog box in PageMaker demonstrates the flexibility of the program's indexing system. Clicking on the Topic button yields a list of all the topics currently in the index. Selecting a topic adds a reference to the current page number to that entry.

Rotation and skewing PageMaker lets you rotate only text blocks, only when they're unthreaded, and then only in 90-degree increments. QuarkXPress lets you rotate page elements in microscopic increments (you can even edit and format rotated text) and rotate and skew the contents of picture boxes.

In-line elements and paragraph rules Where PageMaker lets you work with in-line graphics, QuarkXPress works with in-line *boxes;* and those boxes can contain either text or graphics. In either case, the elements move along like any text character as text reflows.

Paragraph rules in the two programs are virtually identical in function, except that PageMaker has serious limits on line attributes in general. Each program lets you specify the position of rules (before and/or after paragraphs) relative to text baselines. PageMaker's automatic controls are nice for beginners, but QuarkXPress provides more flexibility.

Imported graphics You can import all the major file formats into the two programs (QuarkXPress also imports raster image file format [RIFF]—handy for ImageStudio and ColorStudio users). And QuarkXPress and PageMaker

IF A BLUE CIRCLE LIES ON TOP OF A RED SQUARE, QUARK WILL SPREAD THE BLUE CIRCLE SLIGHTLY—OVERPRINTING ON THE RED SQUARE—TO PREVENT A WHITE LINE APPEARING BETWEEN THE TWO ON PRESS.

treat cropping and scaling about the same, except that you can specify a percentage in Quark, and PageMaker has a feature that automatically scales bitmaps for best results at various resolutions.

QuarkXPress's image control for bitmaps (contrast, brightness, gamma correction, and halftone settings) is superior to PageMaker's, though it's still not much by image processing standards.

Color Both programs let you specify colors using several models, print on color printers, and create spot-color overlays. QuarkXPress also lets you pull process-color (cyan, magenta, yellow, and black) separations of everything except color bitmaps (you can do those as well if you buy a program like Adobe Photoshop or SpectreSeps QX that creates Desktop Color Separation files).

If you buy Aldus PrePrint, PageMaker gives you full process-color capabilities, including separations of color bitmaps. PrePrint requires that you print PostScript to disk from PageMaker, though, and then run that file through PrePrint. If neither you nor your service bureau has process-separation software, you have no process-separation abilities at all.

In spot-color work, again, QuarkXPress beats PageMaker hands down. Since you can't specify a percentage tint for PMS colors of type or lines in PageMaker, there's no way to specify, for instance, an 80 percent tint of PMS 276 for subheads. Can't be done. Nor (in the absence of PrePrint) will PageMaker knock out the colors underneath a spot-color EPS graphic. QuarkXPress will.

QuarkXPress also has automatic trapping: if a blue circle lies on top of a red square, for instance, Quark will spread the blue circle slightly—overprinting on the red square—to prevent a white line appearing between the two on press.

Document Construction

Spreads and master pages Where PageMaker lets you create only 2-page spreads, in QuarkXPress you can create multipage spreads—for a threefold brochure, for instance. QuarkXPress lets you build up to 127 master pages (254 facing pages) per document to serve as templates for your document pages. So you might have different master pages for section openers and chapter openers in a book. And Quark lets you change master items on document pages; PageMaker doesn't. When you alter a master page in Quark, you can choose whether previously created document pages should change or remain as they were originally created.

DAVID BARRY

Up to Here Steve Gordon, electronic studio manager for Perkins/Butler, the direct-marketing division of Chiat/Day/Mojo Advertising in New York, supervises the agency's QuarkXPress users. Perkins/Butler produces black-and-white mechanicals, marking them up for traditional color stripping and separation. Says Gordon, "QuarkXPress gives us all the typographic control the agency is looking for."

Text flow and autowrap Both programs can flow imported text through multiple columns and pages, adding pages as needed. QuarkXPress lets you specify the number of columns within a text box and then reflows everything into the specified number of columns. PageMaker, in contrast, has no text boxes, and once you've flowed text into columns, you have to manually rework the whole thing to change the number of columns.

QuarkXPress wraps text around text boxes, graphics boxes, and the graphics themselves, or you can specify your own polygonal text-wrap boundary. PageMaker also has polygonal wraps, but the program won't wrap around text blocks or do automatic irregular wraps.

There's one other key difference in how the two wrap text: QuarkXPress includes paragraph indents in wrapped items; PageMaker ignores paragraph indents when wrapping text, so it wraps tight to the wrap boundary. While there are some situations where Quark's method is useful, there are more where it's incredibly troublesome.

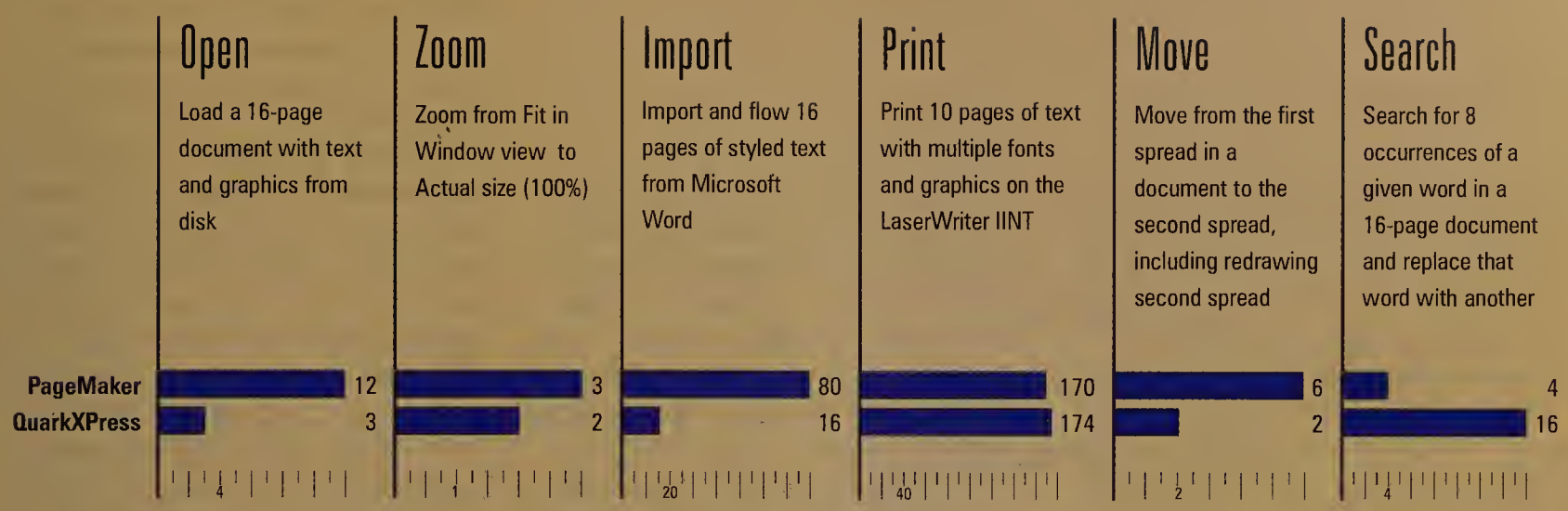
Long Documents

Sections and page numbering The only difference here is that QuarkXPress lets you break up documents into section breaks, and each section can have its own distinct numbering. With PageMaker you cannot break a document into sections, but you can chain multiple documents into a book for printing and indexing (the numbering isn't updated between documents automatically).

Generating tables of contents and indexes This category is simple. PageMaker does an excellent job of building tables of contents and indexes (though for indexing you still need to think). QuarkXPress has no tools for those jobs, but the Sonar Bookends

Time Trials

All times are in seconds.



When it comes to speed, QuarkXPress has a clear edge over PageMaker. Quark repaints the screen faster, but what isn't revealed here is that it repaints the screen much *less frequently*. PageMaker is constantly redrawing everything on the page, even when you make minor adjustments.

These tests were conducted under Finder with MasterJuggler and the LaserWriter Plus screen fonts, on a Macintosh IIcx with 8MB of memory, an Apple 13-inch color monitor, and an Apple 256-color video board.

XTension ($129.95) makes these features available.

"Continued on" lines Same story here, but in reverse. QuarkXPress provides for automatically updated "continued on page *xx*" and "continued from page *xx*" lines attached to text boxes. PageMaker has no equivalent.

Source-file management PageMaker's Links controls put it well ahead of QuarkXPress for tracking and managing all the source files and revisions (of text and graphics) that make up a publication—keeping track of what's changed and updating as necessary. The Picture Usage XTension (included with QuarkXPress) offers similar but less-powerful features for graphics, and the CopyFlow XTension ($395) offers excellent file management features.

Text and Type

Word processing Text editing is difficult on laid-out pages because you're always scrolling all over the place, so PageMaker provides a Story Editor command—which brings up a word processing window where text appears without formatting; changes made in the story editor appear automatically in the formatted document. QuarkXPress has no such facility. On the other hand, PageMaker needs the story editor more, since PageMaker's screen updating is slower (and it updates more frequently).

You can perform find and change operations and check spelling only from PageMaker's story editor. With QuarkXPress, you do everything in normal layout view; it's nice not to jump between modes, but it gets pretty slow when you're checking spelling or searching a heavily formatted document.

The programs' Find and Change features (for text and/or text formatting) are almost identical, with one exception: PageMaker lets you find and change paragraph styles in addition to font, size, and type style (a very useful feature).

Spelling checks While QuarkXPress's spelling checker is serviceable (and works better than PageMaker's if you want to check just a single word), PageMaker's spelling checker works better for checking whole stories or documents. When you tell the spelling checker to ignore a word it doesn't recognize, PageMaker remembers and doesn't flag that word on any subsequent spelling checks during that session. QuarkXPress's auxiliary dictionary is a text file that you can edit with a word processor—for example, you could copy your word processor's dictionary right into XPress's auxiliary dictionary. Not so for PageMaker.

PageMaker uses the same dictionary for both spelling and hyphenation. When you add a word to the dictionary during a spelling check, Page- Maker even suggests ranked hyphenation points (and lets you enter your own) and then hyphenates the word according to those points from then on.

Type attributes and leading You can specify type size in an acceptably large range of sizes in both programs, but QuarkXPress has an edge in type size and leading increments—.001 point compared with PageMaker's .1 point—important when fitting display type to an exact width. Quark offers a superior leading method—baseline-to-baseline—though PageMaker's proportional leading is equally effective once you get used to it.

Kerning and tracking Beyond the automatic kerning that has become de rigueur for page-makeup programs, both programs offer tracking—automatic spacing adjustments for different fonts at different sizes—and manual

PageMaker offers superior tools for working with leading-grid-based designs. Its custom vertical Rulers and Align to Grid feature are much more flexible than QuarkXPress's Lock to Baseline Grid feature.

kerning. PageMaker's kerning increments are a little bit coarse at .01 em, while Quark's are infinitesimal (.005 em). Also, QuarkXPress includes kerning and tracking table editors; with PageMaker you need to buy third-party programs (Edco's $99 LetrTuck and PMTracker, for instance). PageMaker provides prebuilt tracking tables, however, for the PostScript fonts that come with a LaserWriter NT. With Quark you have to build your own.

Baseline shifts, superscripts, subscripts, and drop caps Both programs let you control the size and position of superscripts and subscripts. PageMaker lets you control this on a character-by-character basis, while QuarkXPress's controls apply instead to a whole document. Quark also lets you control both horizontal and vertical scaling, however, even for small caps and superior characters (PageMaker has no superior type style).

In addition, QuarkXPress has an explicit baseline shift control for moving characters up and down. With PageMaker you have to fiddle with the superscript and subscript settings for selected characters.

QuarkXPress's automatic drop cap function is one of the greatest boons to desktop publishers ever invented. While you can now create initial caps that flow with the text in PageMaker (using the superscript and subscript controls), Quark's function—designed specifically for drop caps—far outclasses that workaround.

Hyphenation and justification PageMaker and QuarkXPress have very similar justification parameters, but the two programs vary significantly in hyphenation approaches. PageMaker has a large ranked-hyphenation dictionary (with each word break ranked for how good a break point it is) in addition to a hyphenation algorithm. Quark offers only algorithmic hyphenation, with a small dictionary of exceptions to which you can add. PageMaker's hyphenation is significantly better as a result.

JAMES HAGGARTY

Farming It Out Laura Janukowitz, Electronic Design Systems Manager for The Type Source in Saskatoon, Saskatchewan, is responsible for output of *The Western Producer*, Canada's largest farm weekly. Says Laura, "We use QuarkXPress for almost all of our work; we love the features but have had a lot of trouble with system crashes and other anomalies."

QuarkXPress lets you save and reuse hyphenation and justification parameters and incorporate them in styles, and the program can restrict itself to suggesting hyphenation points if you prefer manual hyphenation. PageMaker can highlight loose and tight lines (those it can't justify within your word-spacing and letterspacing parameters) so you can fix them manually (one of the XTras XTensions will search for loose and tight lines, which is somewhat less useful).

Keeps and breaks Both programs let you prevent a paragraph from breaking across a page, as well as letting you keep a paragraph together with ensuing paragraphs (to keep subheads with following text, for instance).

Leading grids, vertical alignment, and justification PageMaker offers superior tools for working with leading-grid-based designs (where vertical measurements are based on body-copy leading). Its custom vertical Rulers (with the Snap to Ruler option) and Align to Grid feature are much more flexible than QuarkXPress's Lock to Baseline Grid feature.

On the other hand, QuarkXPress will align text at the top, middle, or bottom of a text box, or justify it vertically, inserting space between lines and paragraphs to fill the box. PageMaker, which doesn't use the text-in-a-box metaphor, offers no similar feature.

Tabs PageMaker and QuarkXPress are about equal in their tab-handling powers, with a couple of exceptions. PageMaker lets you change an existing tab stop by selecting it and typing in a new position, leader character, and/or alignment. Quark's Apply button (and auto-apply) makes it easier to see results immediately and set tabs interactively.

Table Editor, a separate program bundled with PageMaker, lets you build spreadsheet-style tables with multiple lines of text within each table cell. It's weak typographically, however, so it's not very useful for high-quality work, and it only saves tables in PICT format, so you can't edit them on the page.

Special characters Both programs offer the basic complement of special characters (line breaks, en and em dashes, thin spaces, and so on), but QuarkXPress lets you make any of those characters either breaking or nonbreaking.

QuarkXPress's Indent to Here character causes the rest of the paragraph to indent to the location of that character. You can make special characters visible in Quark; the same is true in PageMaker, but only in story view.

Style sheets Styles operate similarly in QuarkXPress and PageMaker, basically following the Microsoft Word model. PageMaker offers more control over the interaction of styles and local formatting, however, and its Styles palette makes editing and applying styles easier. In Quark you can assign keyboard shortcuts for applying styles. If you can remember the shortcuts, Quark is faster than PageMaker; otherwise Quark is slower because you have to go through a hierarchical menu.

There's no way to merge two styles in Quark. If you have paragraphs tagged "normal" and "body copy" and you want them all tagged "body copy" (a common scenario if you use Word), there's no way to do it.

QuarkXPress's biggest problem with styles, though, is that you can't see what style is applied to a paragraph without going to a hierarchical menu (no, it's not on the Measurements palette). In PageMaker the current paragraph's style is visible in the Styles palette; in Story view each paragraph's style is called out to the left of the paragraph.

Text filters Both programs offer good import and export filters for Mac word processors. PageMaker offers filters for IBM PC and compatible word processors (and an RTF—rich text format—filter, useful for power users of Microsoft products), while QuarkXPress offers a wonderfully robust embedded-text tagging and coding language that lets you specify just about any of its formatting controls via embedded text commands—great for database publishing and highly automated production publishing. PageMaker's Smart ASCII filter pales by comparison.

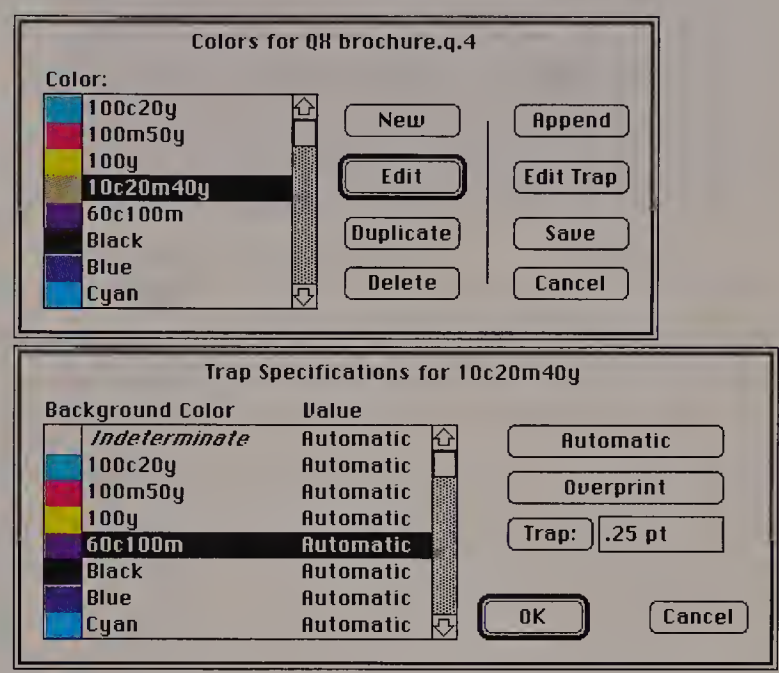
Stability and Support

Stability QuarkXPress has a history of multiple maintenance upgrades following major releases, and version 3.0 is following in that tradition. A patch came out within a month of 3.0's release (and another is imminent as of this writing), but the program is still much less tolerant of diverse systems than PageMaker is. Some users report no problems, while others have ongoing and serious difficulties. PageMaker is quite solid by comparison, and stands out especially for not losing work when the system does crash (largely due to its mini-save feature, which saves changes whenever you turn pages).

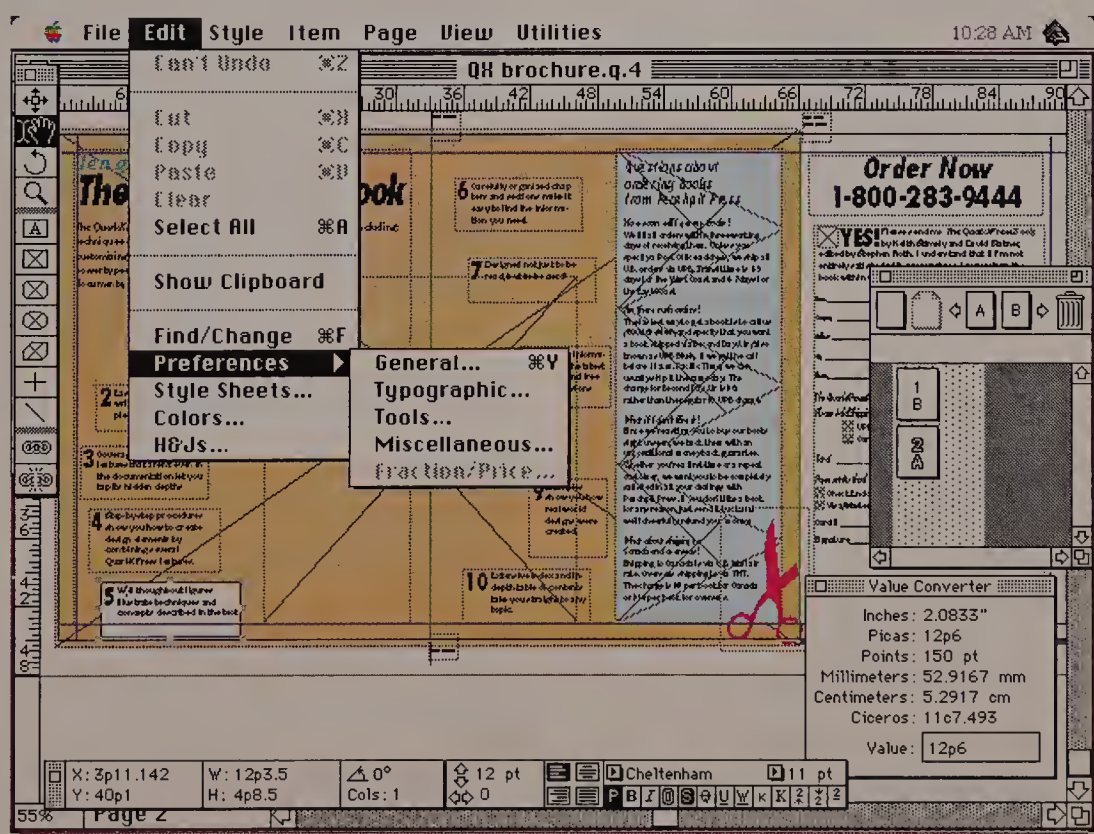
Manuals and help While they're far from perfect, PageMaker's manuals are better than QuarkXPress's, which are prone to heavily worded statements of the obvious, such as, "To specify whether you want to print to photographic paper or clear film in the imagesetter, click either Paper or Film in the Paper Type area."

PageMaker's online help also exceeds QuarkXPress's menu-item and palette descriptions, with topics like "Converting 3.0 documents" and "Long documents in PageMaker."

Tech support The quality of support is difficult to quantify, but Aldus has a much better reputation than Quark in this area as well. Quark is in the difficult position of having a user base that is growing rapidly; but whatever the reason, QuarkXPress users report endless ringing and busy signals. Aldus also has better policies.



Colors and Traps Not only can you build libraries of colors in QuarkXPress for both process- and spot-color separations, you can also specify that any two colors should trap, or overprint, where they meet. Typing a negative number in the Trap field results in a *choke*—the surrounding color encroaching on the surrounded.



Tools and Controls QuarkXPress offers palettes for tools, document layout, measurements, and (part of the Freebies XTensions) a measurement value converter. You can set preferences for many aspects of the program's tools and controls.

FINAL REPORT CARD

For each boldface subhead below (Rulers and Guides, for instance) the author has assigned an overall grade that reflects the program's performance as a whole in this area. The subheads underneath detail the key differences that distinguish one application from the other. If both programs have a feature, and it works equally well in each, it is not covered.

Grades were awarded on the following scale: **A** Yes, or offers everything available in either program. Feature is well implemented. **B** Very usable, but missing some features, or features are not well implemented. **C** Still usable, but missing important features, or features are badly implemented. **D** Barely usable, glaring absence of features, or terrible implementation. **F** No, or feature is missing from applications.

INTERFACE

	PM	QX
Windows, palettes, tools, and controls	**C**	**A**
Number of open documents	1	7
View multiple spreads	F	A
Drag items between documents	F	A
Color and style palettes	A	F[1]
Document layout palette	F	A
Libraries	F	A
Measurements palette	F	A
Magnify tool	F	A
Change and save tool settings	C	A
Rulers and guides	**A**	**C**
Smallest increment at 400% magnification (in points)	1	3
Custom vertical ruler	A	F
Snap-to-ruler increments	A	F
Custom points per inch	F	A
Ruler guides	A	C
Zooming and scrolling	**B**	**B**
Grabber hand	A	F
Fit in Window command centers page	A	F
Custom zoom (percentages and increments)	F	A
Zoom to marquee-dragged area	F	A
Center selection when zooming	A	F
Thumbnail views	F	A
Continuous redraw while scrolling	F	A
Scroll between spreads	F	A

PAGE ELEMENTS

	PM	QX
Lines, boxes, ovals, and polygons	**C**	**A**
Oval and polygonal graphic boxes	F	A
Arrowhead lines	F	A
Set radius for rounded corners	B	A
Line weights, fills, and tints	**C**	**A**
Custom line weights and percentage fills	F	A
Assign different color/tint to line and fill	F	A
Apply percentage of spot color to type and lines	F	A
Custom borders	F	A
Selecting, moving, and scaling	**B**	**B**
Select items through layers	A	F
See items while moving and scaling	A	F
Move, position, and scale numerically	F	A
Nudge items	F	A
Scale ovals and polygons proportionally	F	A
Grouping, alignment, and distribution	**D**	**B**
Group items	D	B
Align and distribute items	F	A
Duplicate and step and repeat	B	A
Rotation and skewing	**D**	**A**
Type-rotation increments (in degrees)	90	.001
Edit rotated type	C	A
Graphic-rotation increments (in degrees)	na	.001
Skew graphics	F	A
In-line elements and paragraph rules	**B**	**A**
In-line text boxes	F	A
Paragraph rules	B	A
Imported graphics	**B**	**A**
Percentage scaling (degrees)	na	.001
Scale bitmaps to printer resolution	A	F
Bitmapped image control	B	A
Color (without supplementary software)	**D**	**A**
Spot-color overlays	A	A
Process-color separations	F	A
Separations of color bitmaps	F	F
Knockouts of EPS graphics	F	A
Spot-color separations of EPS graphics	F	A
Trapping	F	A
Color (with PrePrint for PageMaker and with Photoshop or SpectreSeps QX for QuarkXPress)	**B**	**A**
Spot-color overlays	A	A
Process-color separations	A	A
Separations of color bitmaps	A	A
Knockouts of EPS graphics	A	A
Spot-color separations of EPS graphics	A	A
Trapping	F	A

DOCUMENT CONSTRUCTION

	PM	QX
Spreads and master pages	**C**	**A**
Accommodates spreads more than 2 pages	F	A
Number of master pages per document	2	127
Allows changes to master items on document pages	F	A
Maximum page size (in inches)	17 x 22	48 x 48
Text flow and autowrap	**B**	**A**
Multicolumn text boxes	F	A
Automatic irregular wraps	F	A
Paragraph indents and text wrap	A	C
Long documents	**A**	**C**
Sections and page numbering	B	A
Generating tables of contents and indexes	A	F[2]
"Continued on" lines	F	A
Source-file management	A	C[3]

TEXT AND TYPE

	PM	QX
Word processing	**B**	**C**
Story editor	A	F
Find, change, and spelling-check in layout view	F	A
Find and change paragraph styles	A	F
Spellingcheck	**B**	**B**
User dictionaries editable as text	F	A
Same dictionary for spelling and hyphenation	A	F
Type attributes and leading	**B**	**A**
Type-size range (in points)	4–650	2–720
Type-size increments (in points)	.1	.001
Number of type styles	8	13
Horizontal-scaling range (in percent)	5–250	25–400
Horizontal-scaling increments (in percent)	.1	.001
Leading increments (in points)	.1	.001
Leading methods overall	B	A
Kerning and tracking	**C**	**A**
Kerning and tracking increments (ems)	.01	.005
Kerning and tracking editors	F[4]	A
Baseline shifts, superscripts, subscripts, and drop caps	**C**	**B**
Baseline shift command	F	A
Adjust preferences for selected text	A	F
Adjustable superiors	F	A
Horizontal scaling	F	A
Automatic drop caps	F	A

[1] Can import formatted stories from other documents. [2] Styles palette available via an XTension. [3] Available via an XTension. [4] Available from third parties. [5] Available via XTras XTension. [6] F-keys and numeric keypad only. [7] Available with support contract. [8] Closed Friday 3 to 4. [9] From first call.

	PM	QX
Hyphenation and justification	**B**	**B**
Save and load h&j settings	F	A
Suggests hyphenation points	F	A
Ranked dictionary hyphenation	A	F
Keeps and breaks	**A**	**C**
Flag widows and orphans	A	F[5]
Leading grids, vertical alignment, and justification	**B**	**B**
Align paragraphs to leading grid	A	C
Vertical alignment and justification	F	A
Tabs	**B**	**B**
Change tab positions numerically	A	F
Table editor	A	F
Special characters	**C**	**A**
Breaking and nonbreaking spaces, characters	C	A
Indent to Here	F	A
Style sheets	**A**	**C**
Styles and local formatting	A	B
See style applied to current paragraph	A	D[3]
Keyboard shortcuts for styles	F	A[6]
Merge styles	A	F
Text filters	**B**	**B**
IBM PC word processing filters	A	F
Filter for tags and codes	C	A

STABILITY AND SUPPORT

Stability	**A**	**B**
Stability	A	B
Crash recovery/data integrity	A	B
Manuals and help	**A**	**B**
Documentation	A	B
Online help	A	B
Tech support	**A**	**C**
Toll-free number	F[7]	F
Support hours	7–5 M–F[8]	7–5 M–F
Annual support fee	$89–149	$195
Duration of support w/ purchase (in days)	90[9]	90
Duration of support with upgrade (in days)	90	0

Product upgrades from Aldus include some expert tech support (Quark's do not), and additional tech support is available for only $89 per year, compared to QuarkXPress's $195 annual fee. That $89 includes a toll-free number; another $60 buys you priority service and other free or discounted support.

AARON CHANG

Going Deep Steve Werner of Central Graphics in San Diego keeps five imagesetters humming with jobs from all over the country. Two magazines they prepare output for, *Powder* and *Surfer*, are produced with QuarkXPress and PageMaker, respectively. According to Steve, "While I love PageMaker, and love to use it myself, I've been steering more and more of my color customers to XPress."

Which to Buy

QuarkXPress is clearly the overall feature leader. Its numeric positioning, rotation, skewing, oval and polygonal picture boxes, color capabilities, libraries, grouping, alignment (and a dozen other features in Quark's Freebies XTension alone) make QuarkXPress the power program for Mac page makeup. It's a great program for complex designs, and absolutely the top choice for color production.

On the other hand, despite some glaring holes, PageMaker is smoother and simply feels better to use. Its grabber hand, custom vertical ruler, Snap-to-Rulers command, ⌘-click to select through layers, easy-to-grab ruler guides, zooming conventions, stand-alone (boxless) text and graphics, and ability to show objects while they're moving all add up to a wonderful environment for navigating around a document. PageMaker appeals to those who like to design on screen, adjusting everything visually and using the mouse. It may be an easier program to learn. And PageMaker's well-implemented style controls and table-of-contents and index generation make it the leader for long documents.

The other considerations besides features—stability and support—also favor PageMaker. How many problems and frustrating phone calls does it take to cancel out a program's great feature list?

(For those who care, a Windows version of PageMaker 4 should be shipping by the time you read this. A Windows version of QuarkXPress has been announced for shipment sometime in 1991.)

So what's the verdict? I hear about a lot of PageMaker users moving to QuarkXPress these days, but I don't often hear of anyone making the opposite move. The users who switch express a reluctance to leave PageMaker's comfortable embrace and Aldus's reliable support, but they're lured by QuarkXPress's speed, feature list, and well-honed interface. In the near future, we can expect XTensions to continue to fill out QuarkXPress's capabilities. If version 2 is an example, problems with version 3.0 will eventually be worked out. And we can only hope that as Quark's revenues grow, tech support will improve. When all that comes to pass, the choice between these two contenders—currently a difficult one—will be easy. ■

See *Where to Buy* for contact information.

***Steve Roth** is a coauthor of* Real World PageMaker 4.0 *(Bantam Computer Books) and editor of* The QuarkXPress Book *(Peachpit Press).*

AN ASSORTMENT OF PROGRAMS THAT MAKE MANAGING AN APPLETALK NETWORK EASIER

Managing Networks

As any person in charge of an AppleTalk network knows, managing a network is a multifaceted job. One minute you're monitoring network traffic to see where bottlenecks are. The next minute you're trying to determine why a printer has suddenly disappeared from the network. Then there are the larger, everyday issues such as tracking what version of system software each Mac is running.

With the variety of tasks that constitute network management, no single AppleTalk-management program exists that does it all. There are, however, a number of programs and devices that, when combined, are invaluable aids to people who administrate networks. You could even say that no network manager should be without them.

Network-management tools basically fall into six groups. The International Standards Organization (ISO) defines five categories in an attempt to standardize the functions of network management. They are *fault management, performance management, configuration management, security management,* and *accounting management.* Another field of network management, what I call *facilities management,* concerns the users attached to the network, not the network itself (which the ISO categories cover).

Most of the available AppleTalk network tools address fault, performance, and facilities management. But options for the other three areas can be limited and may require a little improvisation on your part.

Finding Fault

Fault management means dealing with abnormal events on a network. You never know when something might go wrong, but it's an occurrence you should always be ready for. Like the Boy Scouts, the motto of all network managers is Be Prepared.

Take the simple problem of loose cable connections, a common reason why a computer on the network can't find a laser printer or a server anymore. You can inspect the cables, but that's difficult—if not impossible—to do when wires are hidden behind walls, in ceilings, or even

BY DAVE KOSIUR

PETER ALSBERG

Managing a LAN

This urban transportation layout represents various aspects of managing a local area network that combines LocalTalk, Ethernet, and token ring networks. The automobiles that run on roads represent AppleTalk packets on LocalTalk networks; the trains on train tracks represent AppleTalk packets on faster Ethernet and token ring networks. The ramps that let autos piggyback onto railroad cars are routers. The service station represents a multiport repeater, such as a StarController.

In situation **A**, a Mac responds to a polling

underground between buildings. A better solution would be to use a program like Apple's InterPoll, Farallon Computing's NetAtlas or PhoneNet CheckNet, or AESP's NetMap to see what devices are visible—and thus what devices are not visible—on the network.

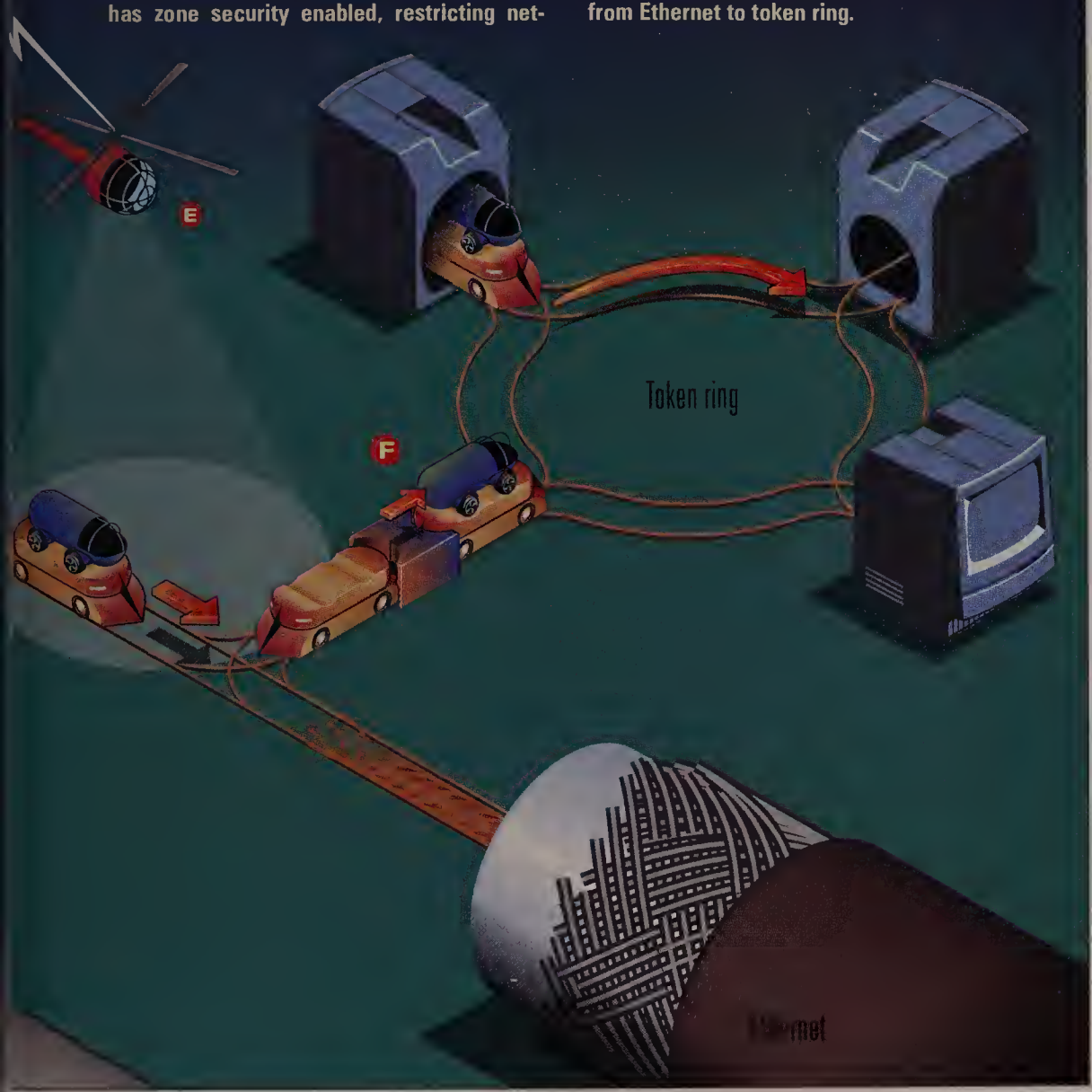
InterPoll, NetAtlas, PhoneNet CheckNet, and NetMap are all examples of network *pollers* (see "Managing a LAN"). InterPoll and NetAtlas enable you to send a series of *echo packets* to a specific device to check the integrity of the cable. The packets are called echo packets because the device being checked should respond and return the same packet contents to the sending device. If that doesn't happen, you know there's a problem with that device's network connection.

On the other hand, rather than sending echo packets to each specific device, PhoneNet CheckNet and NetMap request that every device on the network identify itself. PhoneNet CheckNet and NetMap then list all visible device names.

NetAtlas provides graphical maps of the network. These maps are very useful as references when things go bad on a network (see "Mapping Things Out"). NetAtlas even lets you compare a new map to an old one on screen to see the changes, a convenient feature that makes it easier to find a device that disappears from a network.

A breed of fault-management tools, called *traffic monitors,* is aimed at solving another common network problem: device malfunctions. Sometimes one device—a printer or router, for example—goes bad and starts flooding the network with junk signals. That can slow network performance drastically, even to the point of preventing other devices from communi-

packet by sending a series of answering packets (the string of red cars); those answering packets contain information on the Mac's system configuration and its connection to the network. A polling packet is represented by a single red car on the network. In **B**, a packet analyzer keeps track of the different types of packets on Ethernet, their destinations, and their origins. The gate across the ramp (**C**) represents a router that has zone security enabled, restricting network access to certain users. The dead-end street in situation **D** illustrates a broken connection on the star network; the network manager will discover that when the polling packet fails to make it to any Macs on that arm of the star network. The helicopters (**E**) represent traffic-monitoring programs that report network traffic patterns to the network manager. In **F**, LocalTalk packets are being transferred via the ramp (router) from Ethernet to token ring.



cating over the network at all. (For more information on routers, see "Networking for the Novice," *Macworld,* December 1990.)

Unlike pollers, which actively check for devices on the network, traffic monitors "listen" to the network, a process that enables them to receive all packets sent on the network. Traffic monitors can then display live histograms of network traffic. In addition, because they usually retain information on the source and destination of each packet, traffic monitors can generate cumulative counts of packets, broken down by source or destination. By using traffic monitors to watch the network, you can determine how normal—or abnormal, as the case may be—traffic patterns are. In some cases, you can even pinpoint the device that's causing a slowdown because it's transmitting so much more than usual.

Farallon's TrafficWatch II, which can measure the number of both LocalTalk and EtherTalk packets sent between nodes on a network, is currently the only true traffic monitor available to AppleTalk network managers. TrafficWatch II displays traffic data in real time and includes Microsoft Excel macros for turning saved traffic data into graphs to show where traffic is heaviest (see "Traffic Cop").

But other network-management programs can also act as traffic monitors, even though that's not their primary function. For example, Avant Garde Group's EtherPeek and Neon Software's NetMinder Ethernet both can serve as traffic monitors for Ethernet networks. EDI Communications' MacToken can monitor traffic on token ring networks. (More about these programs shortly.)

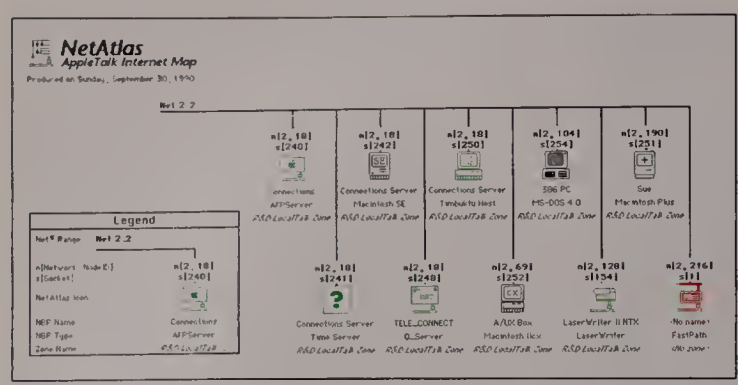
Analyzing Packets

If a traffic monitor reveals that no device is clogging the network, you need to turn to a *packet analyzer.* A router might be transmitting improper routing tables or broadcasting nonsense packets on the network, overwhelming legitimate traffic. Like a traffic monitor, a packet analyzer passively (some might say promiscuously) listens to all the traffic on the network. In contrast with a traffic monitor, a packet analyzer provides much greater information about packets. Not only can you count packets with a packet analyzer, you can also capture those packets for in-depth analysis (see "Managing a LAN").

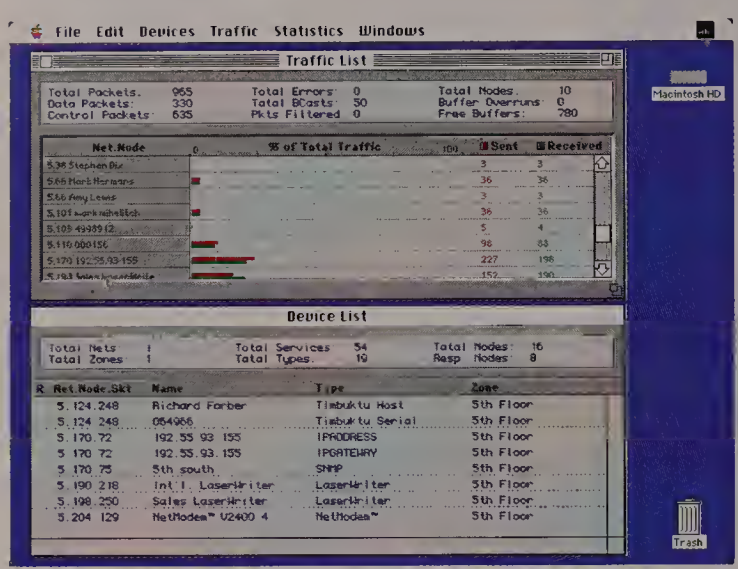
By capturing and analyzing packets on the network, you can determine if any packets are erroneous. If, for example, a router is sending an incorrect routing table over and over again due to a hardware failure, comparing routing tables from a healthy router with those from a sick router can tell you what is wrong. (If you are comfortable doing this on a regular basis, you are definitely a network guru.)

The first packet analyzers, Novell's LANalyzer Network Analyzer and Network General's Sniffer, are available as stand-alone units using portable PCs or as software that can be run on any MS-DOS computer. Both the LANalyzer and the Sniffer can capture and store Ethernet and AppleTalk packets in addition to packets generated by Transmission Control Protocol/Internet Protocol (TCP/IP), Arcnet, and Xerox Network Service (XNS) protocols.

But the LANalyzer and the Sniffer are expensive, ranging in price from $9980 to $20,000, and they don't run



Mapping Things Out The network maps created by Farallon's NetAtlas can be as detailed as you like (as in this example), showing node numbers, device names, zone names, and computer models. You can reduce the map's size to show, for example, just the symbols and names of each machine.



Traffic Cop Bar graphs are one of the simplest ways to monitor network traffic for peaks or lulls. TrafficWatch II from Farallon Computing displays live histograms of traffic percentages for each device on the network. In addition, Traffic Watch II does double duty as a poller by showing a list of devices on the network.

on Macs (even though they can analyze Mac networks). A reasonable alternative is to use Mac software, such as EtherPeek or NetMinder Ethernet, which offer similar capabilities to—though not all the facilities of—the LANalyzer and the Sniffer. Instead of a PC, EtherPeek and NetMinder Ethernet employ either an SE/30 or a NuBus Ethernet board to monitor the network. This means, of course, that you must have an Ethernet network for the programs to be of any use.

EtherPeek and NetMinder Ethernet are similar to TrafficWatch II in that they can collect traffic data, but EtherPeek and NetMinder do so only on Ethernet networks. Either program lets you display packet contents in an easy-to-use manner. You can use filters to select only those packets corresponding to specific protocols and destinations. Graphs can display traffic according to the source or destination nodes or according to protocol type—AppleTalk or TCP/IP, for example (see "Analysis without a Couch").

If you manage Macs on a token ring network, EDI Communications' MacToken is the packet analyzer for you. MacToken uses the Apple TokenTalk NB board in a Mac II as the interface to a token ring network. In addition to graphically displaying network traffic data such as packet size and ring utilization, MacToken can also display a logical map of the network and a network event log that can be color-coded for selected events.

If you want to analyze packets on a LocalTalk network, you currently have one option. Watch is a free program written by two engineers from Cayman Systems. It can display and analyze packets from both LocalTalk and Ethernet networks; it also includes some rudimentary graphs of packet counts and traffic. Although Watch is updated from time to time—the program and updates are available on Internet and AppleLink—Cayman does not offer technical support for it.

There are two new LocalTalk analyzers that should be available soon. The Avante Garde Group has announced LocalPeek, a program that provides the same packet analyzer and traffic monitor functions that EtherPeek does. Similarly, Neon Software is going to offer a LocalTalk version of NetMinder Ethernet, dubbed NetMinder LocalTalk, which captures, analyzes, and decodes all AppleTalk protocols running on LocalTalk networks.

Managing Configurations

As networks get larger, they inevitably include more network devices: repeaters, routers, gateways, and so on. Without proper tools, maintaining such devices can be a manager's nightmare.

One solution is to use proprietary vendor software to manage everything. It's limiting, of course, because you then must buy every router, gateway, and so forth from just one manufacturer.

The advantage is that you can usually configure a device (assign zone names and network numbers for routing) and collect basic statistics on the device's operation (number of packets in, number of packets out) in one fell swoop with one piece of software. Most of the software currently available in this category ships with the hardware.

Examples of such software include Shiva Corporation's Internet Manager and Network Resources Corporation's (NRC) MultiGate Manager. They recognize, configure, and control all Shiva and NRC internet products, respectively. MultiGate Manager is particularly interesting because it interfaces with an Oracle database to make data integration and report generation easier. Farallon's StarCommand software and Nuvotech's TurboStar software are designed to configure and control their respective star controllers; StarCommand works with both LocalTalk and Ethernet star controllers.

Other tools that you can use to maintain device configurations and names are Farallon's Timbuktu and Timbuktu/Remote. If you have all your diagnostic and control programs on the Mac in your office, you can use Timbuktu to run those programs from any other computer on the network. Timbuktu/Remote, meanwhile, enables you to check things from home. The Timbuktu solution is convenient, but it's not completely foolproof. If you can't connect to the Mac in your office, you won't be able to do anything for the network.

Feeling Secure

Security is another important aspect of managing a network, especially if you store confidential information on a file server. Luckily, routers such as those from Shiva, Solana Electronics, and Farallon now include an option

to make the network zones that they define available to everyone or only to users in selected zones. This capability prevents users in one department from using the film printer in another department, for example.

If you permit remote access of the network by modem, there are two different levels of access control you can opt for. The most basic is password security: a user who dials into the network must provide the correct password to connect. Shiva's NetModems and NetSerial both offer password options, as does Solana's R-Server and C-Server.

If a simple password scheme isn't secure enough for your purposes, you can use what's called *dial-back,* or *callback,* control. With callback, the user calls the device and tells it his or her name. Then the device breaks the connection. It then looks for that name on its list of permitted callers, and calls the user back at the phone number it has listed for that user.

Farallon's PhoneNet Liaison, a software router, is the only program that offers callback control for dial-in network access. Liaison can also log all calls made into the network, as well as let you control the zones a dial-in user can access.

Network Accounting

Accounting management doesn't mean keeping CPAs in line. Nor does it mean adding up the costs of cabling and workstations. Instead, accounting management lets you track who uses which network resources—laser printers, modem lines, and so on—and how often. Accounting-management software provides usage logs that let you charge back to the proper departments the cost of maintaining those devices. Or you can use the logs to prove that the network needs either expanding or upgrading.

Unfortunately, there's little available in the way of Macintosh-based accounting-management tools. AppleShare's own administration program produces very little usage information about its server volumes; you can use it, however, to generate a space-usage report. Electronic-mail programs—QuickMail, InBox, MS Mail—also can provide reports on disk usage for storing messages. If you use a program to spool documents to a laser printer, you may be able to get a usage log from that program. For example, the AppleShare Print Server maintains a print log that you can save as a text file for reviewing and charge-back.

Although they are not specifically designed for network use, Casady & Greene's A.M.E. and SoftView's MacInUse can help you with accounting management. Both programs monitor file use on AppleShare and TOPS servers. And you can use either A.M.E. or MacInUse to keep a log detailing which applications have been launched and when.

But if you really need accounting management, you may have to resort to a PC-based solution. One elegant implementation for printers is PServe from Cooperative Print Solutions. PServe acts as a print spooler for multiple printers and maintains detailed logs for each printer. To use PServe as the spooler, the PC it runs on requires an AppleTalk adapter board. PServe can even generate charge reports for each type of print job. As for file servers, PC-based servers such as 3Com's 3+ and Novell's Netware offer extensive facilities for account management.

Facilities Management

Even if a network is running smoothly, its network manager can still have headaches. There's always the problem of distributing product upgrades and system software. And that's where facilities-management tools take over.

The first facilities-management utility was actually Apple's InterPoll. In addition to checking the integrity of a network connection, InterPoll—if the Responder INIT is installed on each Mac—can identify each Mac and show you the versions of system software and LaserWriter drivers in use. InterPoll is capable of working across zones and can be used on LocalTalk, EtherTalk, and TokenTalk networks.

But that capability is pretty rudimentary. Knowing the versions of the System, Finder, LaserWriter, and LaserWriter Prep files just isn't enough information to solve other conflicts that can occur on a workstation or over the network.

Enter the new heroes in network management. They bear the names

ENTERPRISE-WIDE MANAGEMENT

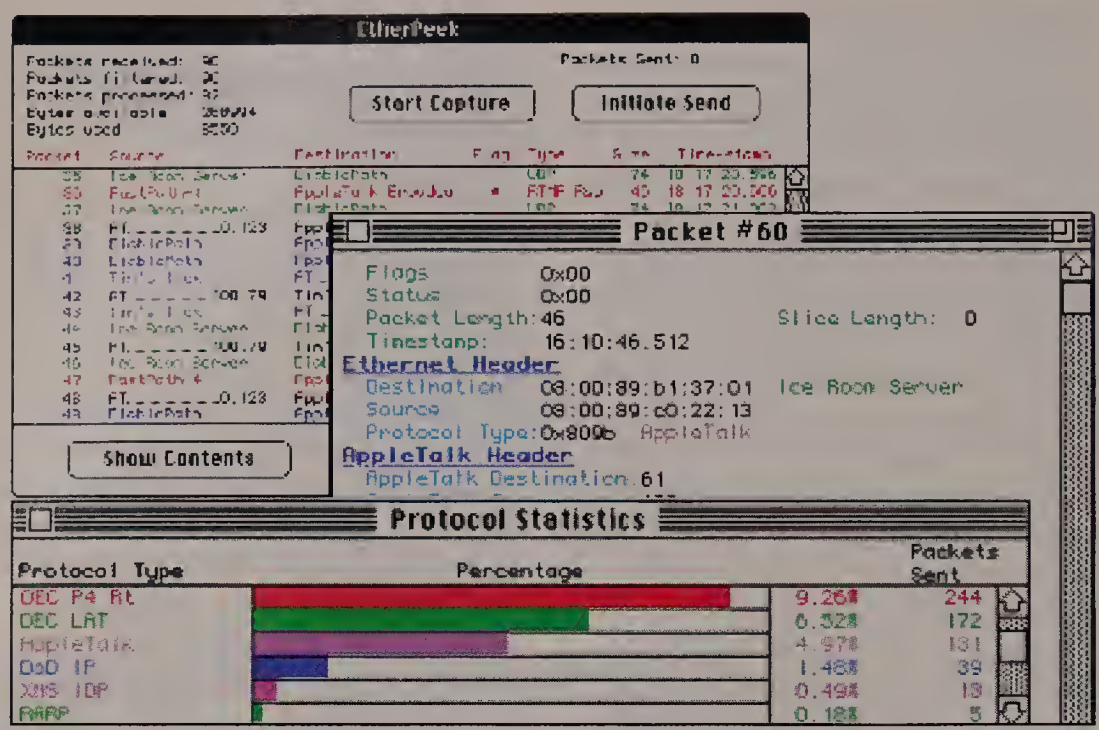
With Macs increasingly becoming a part of large corporate networks—commonly referred to as enterprise-wide networks—it's become vital for Macs to fit in with how those types of networks are managed. Currently, there are three protocols, or frameworks, for managing such large, multivendor networks: IBM's NetView, Digital Equipment Corporation's Enterprise Management Architecture (EMA), and the Standard Network Management Protocol (SNMP).

Of the three, only SNMP, which runs over TCP/IP networks, can recognize Macs and AppleTalk routers. One reason for this is SNMP's extensibility. Any vendor can add management information to SNMP packets for its devices. That's allowed companies like Cayman Systems, Shiva, and Network Resources Corporation to add SNMP-compatible information to their IP routers.

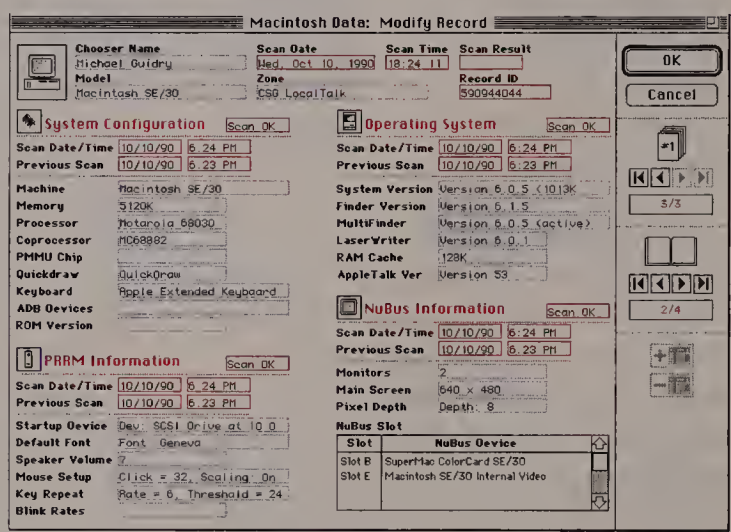
But SNMP's extensibility is also one of its problems. If SNMP-management programs from other vendors can't recognize that added information, it's lost on the network. The device can't be seen, much less managed, by the management program.

In July, Apple announced that as part of its ongoing joint development effort with DEC, Apple would support EMA by creating an AppleTalk tool for DEC's DECmcc management station. That software, currently under development, would allow network administrators to manage, control, and configure both DECnet and AppleTalk environments with one set of network-management tools.

None of IBM's NetView systems or add-ons recognize the Macintosh as a manageable entity, nor do they recognize AppleTalk networks. Does that surprise you?



Analysis without a Couch Packet analyzers provide a wealth of information that you can use to troubleshoot or analyze a network. After you capture a series of packets, EtherPeek displays header information for each captured packet with symbolic names or logical addresses (top). Double-click on one row, and the program decodes the protocol (the middle screen shows an AppleTalk Transaction Protocol request to a file server). You can also view bar graphs of the traffic levels in and out of every node or the distribution of protocol types in the traffic (bottom).



Finding the Users Facilities-management programs make it easier to keep track of Macintosh hardware and software configurations. SuperVisor from CSG Technologies (shown here) even includes a way to let you draw layouts of the Macs in a network and the rooms they are in. You can then use those layouts to pinpoint computers you want to check.

NetControl, StatusMac, Network SuperVisor, NetUpdater, Administrator's Aid, and Aperture Network & Resource Manager. They just may let you sleep more peacefully every night by giving you a better handle on Macintosh hardware and software configurations.

ICATT's Administrator's Aid lets you send messages that can be displayed on Macintoshes at start-up. For example, one message could remind users to update a file; another could tell users to delete outdated files. In addition, Administrator's Aid lets you automatically copy or delete files from a workstation's System Folder. (Obviously, this capability requires careful and judicious use on the part of a network manager.) Administrator's Aid actions can be set so that they affect individuals, groups, zones, or everyone.

International Business Software's NetControl, Pharos Technologies' StatusMac, and Network SuperVisor from CSG Technologies use either an E-mail form or a small, easily transportable application to collect a fairly extensive profile of each workstation. How extensive? Well, you can see which INITs are loaded, the amount of RAM cache used, the versions of applications used, what hardware and NuBus boards are in the machine, and so on. It's important to point out that none of these programs can peek at, see, or otherwise collect information contained in personal files on individual Macs.

No wonder, then, that a database is needed to keep track of all this information. StatusMac and NetControl use a built-in database, while SuperVisor is based on 4th Dimension, giving it added flexibility in generating reports and statistics (see "Finding the Users").

The success of these programs depends on the active participation of each user on the network. (Individual users are usually responsible for running the profiler that collects information.) Users should be aware that if they fail to send in a profile to the network manager, they risk not getting an update to a needed software program.

Merely being able to collect system data to look for conflicts isn't enough. You want to be able to correct those conflicts over the network, if possible. For instance, you may want to send a new version of the LaserWriter Prep file to certain users. MDG Computer Services' NetUpdater is designed with this kind of network management in mind. It allows you to define scripts for certain actions, such as "update QuickMail address books" or "replace Compactor 1.0 with Compactor 1.2." You can then apply these scripts to selected Macs on the network.

Aperture Technologies' Aperture Network & Resource Manager, meanwhile, offers some unique network-

APPLE'S MANAGEMENT SYSTEM

One beef many networking vendors have is the lack of any Apple-defined network-management protocol for AppleTalk. That situation should change soon, as Apple is busy putting the final touches on its first release of a management system for AppleTalk networks.

Initially, Apple's AppleTalk Management Protocol (AMP) and management products will primarily be concerned with collecting information from routers. The AMP specifications have been seeded to the various router manufacturers, so that AMP will be supported by all routers when Apple ships its management software.

management capabilities. Based on graphical database technology, the program allows you to maintain databases for information as diverse as floor plans, site plans, users, equipment, wiring closets, and organizational charts. Then, you can tie floor plans with equipment information, tie site plans with user information, and generate reports. By keeping all this information in one central location, Aperture Network & Resource Manager relieves headaches for network managers.

Managing to Manage

With such a broad slate of network-management tools, what should you use? Since no one program will meet all your needs, it's up to you to create your own network-management toolbox.

Many network-management functions, such as checking traffic and searching for missing devices, are best handled by Farallon's PhoneNet Manager's Pack. The PhoneNet Manager's Pack was obviously designed with these problems in mind, since it includes such necessities as PhoneNet CheckNet, TrafficWatch II, and NetAtlas. This package should cover many problems in both LocalTalk and EtherTalk networks.

If you're using an Ethernet network that has other protocols running on it besides EtherTalk (TCP/IP or DECnet, for example), and you don't yet have an analysis tool for the network, either EtherPeek or NetMinder Ethernet will serve you well. EtherPeek displays more data graphically, but NetMinder offers some calculations, such as bandwidth utilization, that are useful. Although its interface and functionality aren't as developed as those of either EtherPeek or NetMinder Ethernet, Watch is good for checking packets on both Ethernet and LocalTalk networks. If you're running on token ring, there's only one choice: MacToken.

For those who have to manage software distributions and updates, NetUpdater is the most versatile package, since it not only obtains information on the software being used but also facilitates networkwide updates. If you are not worried about the update procedure, I suggest using Network SuperVisor, partly because it can tie facilities information to drawings of the physical locations of the Macintoshes.

Whether it involves software updates, troubleshooting, or system security, managing a network is almost always a challenge. You can easily resist the temptation to throw your hands in the air by putting network-management tools to use and by adapting other programs to network management. Finding the right combination of programs can be a struggle, but the long-term dividends make the effort well worthwhile. ■

NETWORK-MANAGEMENT PRODUCTS

Product	Vendor	Functions*	Price
Administrator's Aid	ICATT	C	$150, 1 zone; $250, 2 to 5 zones; $380, over 5 zones
A.M.E.	Casady & Greene	E	$279; $895, 5 pack; $1495, 10 pack
Aperture Network & Resource Manager	Aperture Technologies	C	$1495
AppleShare Print Server	Apple Computer	B, E	$299, unlimited
EtherPeek	Avant Garde Group	A	$695
Internet Manager	Shiva Corporation	B, D	sold only with Shiva hardware
InterPoll	Apple Computer	A	$129
LANalyzer Network Analyzer	Novell	A	$9980+
MacInUse	SoftView	E	$99
MacToken	EDI Communications	A	$2000
MultiGate Manager	Network Resources	B	TBA
NetAtlas	Farallon Computing	A	sold only as part of $995 PhoneNet Manager's Pack
NetControl	International Business Software	C	$249, 1 zone; $649, multiple zones
NetMap	AESP	A	$99
NetMinder Ethernet	Neon Software	A	$495
NetUpdater	MDG Computer Services	C	$1000, 50 users; $9500, 1000 users
PhoneNet CheckNet	Farallon Computing	A	$95; also available as part of $995 PhoneNet Manager's Pack
PhoneNet Liaison	Farallon Computing	B, D, E	$395, unlimited
PServe	Cooperative Printing Solutions	B, E	sold only through VARs
Sniffer	Network General	A	$16,750+
StarCommand	Farallon Computing	A, B	sold only with StarController; also available as part of $995 PhoneNet Manager's Pack
StatusMac	Pharos Technologies	C	$799, 10 users; $75, 1-user upgrade; $600, 10-user upgrade
Network SuperVisor	CSG Technologies	C	$495, 10 users
Timbuktu	Farallon Computing	B	$149
Timbuktu/Remote	Farallon Computing	B	$195
TrafficWatch II	Farallon Computing	A	sold only as part of $995 PhoneNet Manager's Pack
TurboStar	Nuvotech	A, B	sold only with TurboStar
Watch	Cayman Systems	A	free, Internet or AppleLink

**A = Fault/performance management,*
B = configuration management,
C = facilities management,
D = security management,
E = accounting management.

See *Where to Buy* for contact information.

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PHOTOGRAPHS BY CYNTHIA MOORE

PRODUCER AND RECORDING ARTIST JEFF LORBER RECENTLY USED A MAC IICX AND SOUND TOOLS TO EDIT M. C. HAMMER'S "WE PRAY" ALBUM. "SOUND TOOLS ENABLED ME TO DO EDITS ON MY CURRENT PROJECTS THAT WOULD BE VIRTUALLY IMPOSSIBLE WITH TRADITIONAL RAZOR-BLADE TECHNOLOGY," HE NOTES.

Digital Audio at Last

Digital sound was one of the Macintosh's earliest distinguishing characteristics. Pioneering Mac aficionados quickly customized their computing environments with stock recordings that played at start-up, shutdown, or on command. Third-party products such as MacRecorder, Studio Session, and Jam Session enabled users to incorporate recorded sounds into HyperCard, SuperCard, and MacroMind Director documents.

This was fine if you were satisfied with 8-bit sound recorded at a 22kHz sampling rate. Those in need of affordable compact disc–quality sound had to wait. Until now. Finally, low-cost software and hardware products offer direct-to-hard-disk 16-bit recording and playback sampled at 44.1kHz. And it all works with the point-and-click ease Mac users have come to expect.

The Hardware: Digital Audio Boards

Digidesign's Sound Accelerator NuBus board kicked off the desktop audio revolution. It provides CD-quality stereo audio playback, direct from a hard disk, at –10dBm to +4dBm levels. The frequency response is from 20Hz to 20kHz with a signal-to-noise ratio of greater than 90dB.

The Sound Accelerator board doesn't ship with software for direct-to-hard-disk recording. It does, however, include Digidesign's SoftSynth SA software, a real-time additive and FM-synthesis program, and two utilities—MIDI Preview allows you to play sound files from a MIDI keyboard, and Sound Installer inserts special snth resources into compatible programs or even the Macintosh System file itself. These resources allow the Sound Accelerator to play back both 8-bit and 16-bit, mono and stereo sounds. The snth resources greatly enhance the playback of 8-bit samples and add support of *chunky* sound files, which play back at 8 bits through the Macintosh speaker or at 16 bits through the Sound Accelerator.

Digidesign's newer Audiomedia board is in many ways already a second-generation digital audio board. It differs from the Sound Accelerator by offering four-track playback. This new board also lets you apply multiple EQ and DSP effects in real time. The two main features missing from the Audiomedia board are of interest only to pros: synchronization to external SMPTE (Society of

BY CHRISTOPHER YAVELOW

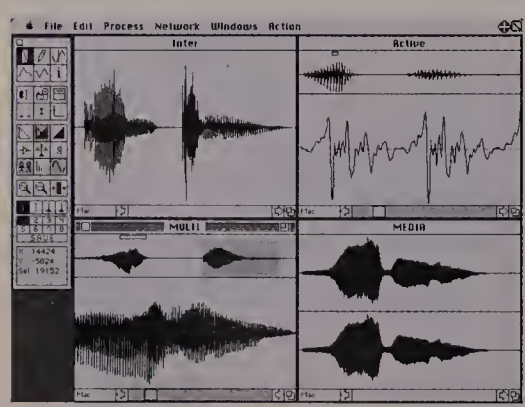
Motion Picture and Television Engineers) Time Code and digital input and output.

The Audiomedia board ships with its own software for recording, editing, processing, and playing back digital audio direct from disk. Two powerful HyperCard stacks provide XCMDs to add digital audio to your own stacks. As is the fashion, Digidesign's Sound Access stack does all the work for you, creating buttons that play specified sounds, installing required resources, and even copying the buttons to the stack you choose.

Analog and Digital Input and Output

To record sound with the Sound Accelerator, you need one or more of Digidesign's hardware sound-input peripherals. The less expensive Analog Interface box connects with the Sound Accelerator via an RS-422 cable that provides left, right, or stereo input from –10dBu to +8dBu. The higher-priced Pro I/O box features balanced +4dBu XLR connectors and Apogee antialiasing filters.

The Rolls-Royce of input devices for the Sound Accelerator is the DAT I/O Digital Interface. This permits transfers of sound data to and from the Mac without leaving the digital domain. The two most popular formats—S/PDIF and AES/EBU—are both supported. A digital audio tape (DAT) deck is required. If you mix down directly to a DAT, your music needn't ever pass through the analog domain till it reaches consumers' ears.



Converting Sound Bytes into Sentences with Alchemy Four sound files are open. Clockwise from upper right: (1) mono sound file zoomed out with no overview, (2) mono sound file zoomed in with overview, (3) mono sound file partially zoomed out with the overview indicating the current selection (grayed area) as well as the current location (small hollow rectangle), and (4) stereo sound file without overview. Alchemy and Sound Apprentice have a single tool palette (unlike Sound Designer II and Audiomedia, which have similar displays but separate tool palettes in each window).

DIGITAL AUDIO DEMYSTIFIED

If you've looked closely at a CD, you may have wondered where the grooves are that you remember from analog vinyl LPs. Those grooves have been replaced by the same 0s and 1s that the Macintosh uses for computing. Here's how it works: just as a motion picture creates the illusion of movement by quickly playing back still images, digital audio plays back "snapshots" of sounds. It takes only 24 frames per second (fps) to fool the eye, but it takes 44,100 sound samples per second to trick the ear. Similarly, just as the size of each image affects realism in film (note the difference between 8mm and 35mm), the size of a digital sample affects its fidelity.

Continuing the film analogy, the increase in resolution between 8mm home movies and 35mm theatrical films is 2000 percent; the speedup from the 16 fps of home movies to the 24 fps of features is a 150 percent gain. With digital audio, increasing the sample size from 8-bit to 16-bit provides a whopping 25,600 percent boost in realism, and doubling the sample rate from 22kHz to 44.1kHz enhances the fidelity even more.

If you've followed these calculations, you've realized that it's going to require 10MB of storage space for a minute of CD-quality stereo sound. The rest of the story is that a hard drive will need an access time of less than 28ms to make this possible. So, if you're using a Syquest removable cartridge drive, for instance, you can get almost 4½ minutes of digital audio on a 44MB cartridge.

What's DAT?

Digital audio tape decks are becoming the standard for professional music recording, and lower prices have brought them into the consumer market. Many digital audio decks record at the 44.1kHz sampling frequency used by compact discs, and when digital audio tapes are copied to one another in the digital domain, there is no signal degradation. Because DAT is a standard (the manufacturers learned their lessons with Beta and VHS VCRs), tapes play identically on any DAT machine regardless of the tape type, noise reduction, or bias settings. Digital audio tape looks like a miniature VHS tape and often carries a warranty guaranteeing that it will "perform to your satisfaction for your lifetime."

The main problem with DAT so far is that DAT recording is too perfect. In fact, with a CD player capable of outputting digital data and a DAT recorder capable of recording digital data, it is possible to rip off an exact copy of the data that was used to master the CD. Record and CD companies are worried that DAT recorders will cut into their profits. Because of lobbying by music industry groups last year, Congress put a temporary halt on consumer DAT imports.

Consumer DAT recorders are now approved for import, and CDs have a *copy inhibit* bit in their subcodes that limits digital recording of the data (note: this does not prevent analog recording by a DAT or any other machine). With the copy-inhibit scheme, you can make one digital copy of a CD or DAT, presumably for use in your car. Fortunately, for those of us who want to make multiple copies of our own music on digital audio tape, professional DAT recorders provide a variety of options to defeat copy inhibit schemes.

Random Access Audio

Besides the advantages of CD-quality playback and recording, direct-to-hard-disk recording provides virtually instantaneous access to any sound or portion thereof on a hard drive. The power of this system will be clear to

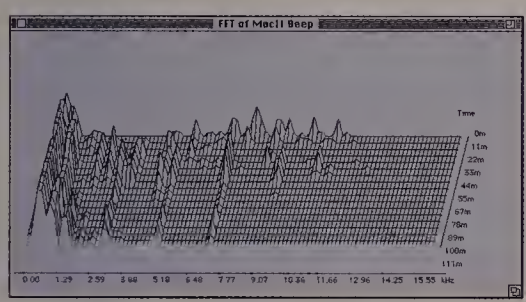
anyone who has ever cut and spliced analog tape or used a mainframe computer system that required waiting for a human operator to find and mount a tape.

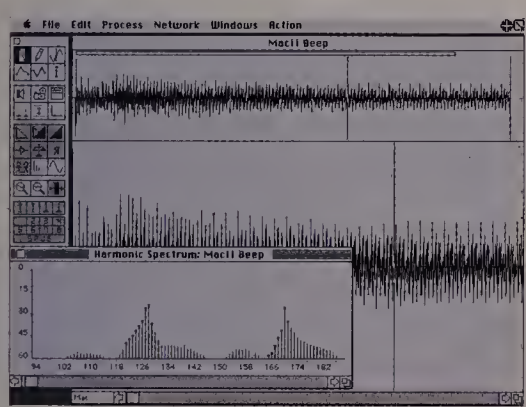
In the analog-tape world, tape recorders are also limited because the tracks are physically aligned with one another. It's almost impossible to slide one track in time with respect to another, and it's difficult to change the order of musical sections without resorting to a razor blade and a splicing block. No matter how sharp your razor is, compared to digital editing it's thicker than prehistoric cutting implements of stone. More important, because digital editing merely involves changing the locations of pointers on a hard drive, it is usually nondestructive—the original recording remains unchanged.

Thomas Dolby, a three-time Grammy nominee, used StudioVision during the creation of his latest album, "Astronauts and Heretics." Although musicians are generally pressured to record in expensive studios, Dolby says, "What I am now able to do at home goes far beyond what I can do in a recording studio. I write songs at home on a grand piano and I have a right to record them here as well—that's the way it should be."

Software Advances

Digidesign's Sound Designer II software, used in conjunction with the Sound Accelerator board and Analog Interface box, completes the Sound Tools package. In earlier incarnations, Sound Designer (and most Sound Accelerator–compatible software) was marketed as editing software for digital sampling keyboards. Many of those features are still present.





Two- and Three-Dimensional Sound Digidesign's uneditable FFT (fast Fourier transform) (top) is a 3-D rendering of how the amplitudes (relative height of the peaks) of the various frequencies (horizontal axis) making up the selection (in this case, the Mac II beep) transform over time (vertical axis, in milliseconds). On the other hand, each frequency bar on Passport's Sound Apprentice and Alchemy 2-D display (bottom) of the same sound file can be edited individually or in groups.

Digidesign and Passport Designs also market sound-editing software for the Sound Accelerator and Audiomedia boards. Besides Sound Designer II, Digidesign also ships a scaled-down version of the same program with the Audiomedia board. Passport also offers two packages: Alchemy and Sound Apprentice. The main thing missing from the Passport programs is the ability to record directly via either of the boards. With the Audiomedia board, this is not a problem because it ships with recording software.

The two Digidesign and two Passport programs all provide a complete set of basic features for editing, processing, and playing back sound from a hard drive (see "Converting Sound Bytes into Sentences with Alchemy"). That's where the similarity ends. The bells and whistles are so different that it would be wise to consider owning programs from both companies.

All four programs compute fast Fourier transforms (FFTs) that analyze a sound's harmonic spectrum. These graphs show the frequencies of the sine waves that make up the sound and how their amplitudes change over time. The Digidesign packages render this analysis in dazzling 3-D, but these graphs are not editable. Alchemy's two-dimensional FFT doesn't show frequency transformation over time—your time reference is the selection's duration—but you can edit the level of each frequency (see "Two- and Three-Dimensional Sound").

Alchemy offers powerful options for editing amplitude and frequency envelopes, options that are missing entirely from Sound Designer. But Digidesign's Playlist options have no counterpart in the Passport products. An unlimited number of playlists may be associated with a sound file. A playlist defines the order of playback for specified sound regions as well as the transitions between those regions. And with random access audio, you can designate any portion of a sound file as a region and have it appear anywhere, any number of times, on a playlist (see "They're Playing Our Song"). Both companies offer parametric EQ, but Digidesign offers digital 7-band stereo or 14-band mono graphic EQ.

Finally, while Passport allows you to mix the Clipboard into a selected region of a single sound file, Digide-

DIGITAL AUDIO FEATURES

	Alchemy	Audiomedia	Deck	Sound Apprentice	Sound Designer II	StudioVision
Version	2.22	1.2	1	1.22	2.0	1.2B1
Company	Passport Designs	Digidesign	Digidesign	Passport Designs	Digidesign	Opcode Systems
Price	$695	$995	$349	$295	$995	$995
SYSTEM CHARACTERISTICS						
Plus/SE/SE30/II/IIx/IIcx/IIci/IIfx	●/●/●/●/●/●/◗/●	○/○/○/●/●/●/●/●	○/○/○/●/●/●/●/●	●/●/●/●/●/●/◗/●	●/●/●/●/●/●/●/●	○/○/●/●/●/●/●
File formats						
Sound Designer (16-bit mono)/II (16-bit stereo)	●/○	●/●	●/●	●/○	●/●	●/●
AIFF (16-bit multichannel)/Dyaxis	●/●	●/○	●/○	●/●	●/○	○/○
snd resource (8-bit/16-bit/chunky/Sound Lab)	●/○/○/●	●/●/●/○	○/○/○/○	●/○/○/●	●/●/●/○	○/○/○/○
RECORDING (DIRECT TO HARD DISK)						
Number of tracks/simultaneous/mono/stereo	*/*/*/*	2/2/mono/stereo	4/2/mono/stereo	*/*/*/*	2/2/mono/stereo	16/2/mono/stereo
Number of sample rates/range	*	9/8K to 44.1K	1/44.1K	*	10/8K to 48K	3/32, 44.1, 48
Record during audio or MIDI playback	NA	○	●	NA	○	●
Loop record/sound on sound	NA	○/○	●/●	NA	○/○	●/○
Punch in and out/with preroll and/or postroll	NA/NA	○/○	●/●	NA/NA	●/○	●/●
SMPTE (MTC) trigger/SPP/MIDI clock	NA/NA/NA	○/○/○	◗/●/●	NA/NA/NA	●/○/○	●/●/●
PLAYBACK						
Preview sound before opening	●	○	○	●	○	●
Sync PB to SMPTE (via MTC)/SPP/MIDI Clock	○/○/○	○/○/○	◗/●/●	○/○/○	●/○/○	●/●/●
Simultaneous MIDI playback	○	○	●	○	○	●*
Playlist/save playlist as sound file	○/○	●/●	○/○	○/○	●/●	◗/●
Digital bounce tracks	○	○	●	○	○	●
DISPLAY						
Sound info in Open file dialog/open multiple files	●/●	○/●	○/○	●/●	○/●	●/●
Amplitude: % of maximum/sample value	●/●	●/○	◗/○	●/●	●/●	●/○
Duration Display						
H:M:S:ms	●	●	○	●	●	●
Feet and frames: 16mm and 35mm	○	○	○	○	●	○
SMPTE 24/25/30 drop/30 non-drop	○/○/○/●	○/○/○/○	○/○/○/●	○/○/○/●	●/●/○/●	●/●/●/●
Sample number (dec and HEX)	●	○	○	●	●	○
Overview (stereo [L & R]/L or R/composite)	●/○/○	○/●/●	○/○/○	●/○/○	○/●/●	●/●/○
FFTs						
3-D or 2-D / # of bands (freqs) /configurable	2-D / 16,384 / no	3-D / 2048 / yes	NA	2-D / 16,384 / no	3-D / 2048 / yes	NA
Cut, copy, paste, mix, and out-point editing	●	○	NA	●	○	NA
EDITING						
Selection endpoints ("auto-zero"/"smooth")	●/○	○/●	NA/NA	●/○	○/●	●/○
Cut/copy/paste/insert/at outpoint	●/●/●/●/●	●/●/●/●/○	◗/◗/◗/◗/○	●/●/●/●/●	●/●/●/●/○	●/●/●/●/○
Clear/clear (close up)/extract (trim)/strip silence	●/○/●/◗	●/●/●/◗	◗/○/○/○	●/○/●/◗	●/●/●/◗	●/●/●/●
Reverse/invert/replicate/separate/scrub	●/●/●/○/○	●/●/○/○/●	○/○/○/○/●	●/●/●/○/○	●/●/○/○/●	○/○/●/●/◗
MIX (Number of files or Clipboard only)	Clipboard	4 mono or stereo	4 tracks	Clipboard	4 mono or stereo	16
Envelope editing (amplitude/frequency)	●/●	○/○	NA/NA	○/○	○/○	◗/○
Normalize/remove hum/noise Gate	○/○/○	●/○/○	●/●/●	○/○/○	●/○/●	○/○/●
Fade in/fade out/crossfade	●/●/●	●/●/●	◗/◗/◗	●/●/●	●/●/●	◗/◗/◗
Change gain (by percentage/by db)	●/○	●/●	○/◗	●/○	●/●	●/○
Sample rate conversion (resampling) limits	to 100K	to 48K	NA	to 100K	to 96.2K	◗
Parametric EQ/graphic EQ	●/○	○/●	●/○	○/●	●/●	○/○
Time compression and/or time expansion by scale and/or duration	●	●	○	○	●	○
Pitch shift/with preserve duration	●/●	◗/○	○/○	○/○	●/●	○/○

** Dependent upon external sampler.*

● = fully implemented; ◗ = partially implemented; ○ = not implemented

sign lets you mix four separate sound files together, stereo or mono, with control over input level, stereo pan, and delay during the process.

Your personal recording needs may require certain amenities. Some people will need Passport's unique *out-point* editing for pasting or mixing from the endpoint of a selection. Or you may require Digidesign's Scrub option that uses the mouse as a videodeck jog wheel to play back sounds in slow motion, forward or backward depending upon the direction and speed of the mouse.

Turn Your Mac into a MIDI Instrument

There are other ways to get digital audio out of a Macintosh. In a joint venture with Emu Systems and Opcode, Digidesign is marketing the MacProteus, a NuBus board version of Emu's Proteus/1 sound module, one of the hottest MIDI instruments of the past two years.

The MacProteus is a multitimbral, 32-voice, polyphonic sample player. Instead of synthesizing sounds, it plays back digital recordings of real instruments stored in 4MB of ROM on the NuBus board—192 presets in all. Because the MacProteus has no front panel with buttons or knobs, the board comes with a software "front panel" that's friendlier than its hardware counterpart.

Digidesign's newer SampleCell is a professional 16-bit, 16-voice, polyphonic sampler on a NuBus board. The board has 8 polyphonic outputs and up to 8MB of RAM for loading samples (it comes with 600MB of instrument samples on a CD ROM). You can have up to four SampleCells in one Mac for a 64-voice, 32MB, 32-output system.

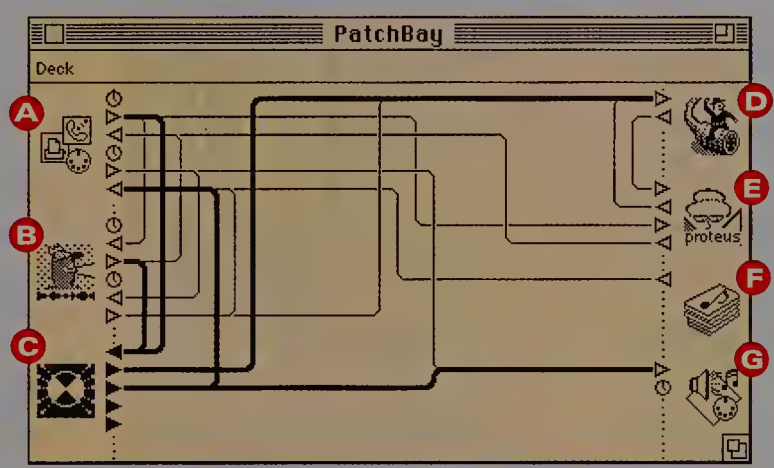
You can play both the MacProteus and SampleCell board with any MIDI keyboard or control them with most MIDI software, as well as HyperCard, SuperCard, or Director. What you won't need is a hardware MIDI interface, because instead of plugging in MIDI cables, you use Apple's MIDI Manager to connect the components (see "Apple's MIDI Manager Ties It Together").

Passport's Sound Exciter also turns a Mac into a MIDI instrument—with software. Because it uses the Mac's internal hardware, Sound Exciter is limited to 22kHz 8-bit samples. The package comes with an "orchestra," but you can use sounds from MacRecorder, any of the programs mentioned in this article, or instruments from Jam Session or Studio Session. Although Sound Exciter responds to all 16 MIDI channels, it is limited to

Apple's MIDI Manager Ties It Together

A) The triangular connectors to the right of the modem and printer port icons indicate input and output connectors. The presence of the clock icon means that timing information may be passed along.

B) Vision supports input and ouput for both printer and modem ports with two sets of 16 MIDI channeis (32 MIDI channels in all).



D) The MacProteus board has one set of MIDI-input and -output connectors.

E) Digidesign provides front-panel controls for the MacProteus board, which can control more than one board with two sets of input and output connectors.

F) Opcode's MIDIplay stack permits MIDI output only.

C) Deck's icon has one MIDI input connector and four MIDI output connectors. The icon is selected and all associated connections are highlighted.

G) Passport's Sound Exciter is a virtual software synthesizer supporting timing and a single MIDI input connector.

Apple's MIDI Manager—a piece of system software consisting of an INIT, a driver, and a desk accessory—permits true MIDI multitasking in MultiFinder. The heart of the MIDI Manager is the PatchBay DA where MIDI Manager–compatible programs and boards automatically appear as icons complete with inputs and outputs ready to plug in to one another by merely dragging. Severing a connection is accomplished by holding the mouse button down until the cursor becomes a knife, and using the knife to cut the desired connection. Double-clicking on an icon in PatchBay typically brings up that program's control panel. Collections of connections such as the one above may be saved as patches and reloaded.

In this illustration, Deck is recording MIDI data coming in from the Mac's modem port. Along with previously recorded data, the MIDI data is then passed to the MacProteus board and Sound Exciter. MacProteus's software "front panel" is wired up to the MacProteus board and is connected to the Mac's printer port to control an external Proteus board. Vision is set up to receive MIDI data from, and send it to, either of the Mac's serial ports and to send data from its modem port to Deck and from its printer port to the MacProteus. In addition to being routed to Vision, MIDI data coming in from the Mac's printer port is passed to the Sound Exciter, as are an additional 16 channels controlled by Deck. Opcode's MIDIplay stack is set up to output its data from the Macintosh's printer port. During this whole process, Deck is playing back three digital audio tracks and recording a fourth audio track, all at CD quality.

playing eight notes at a time. Like the MacProteus, Sound Exciter relies on Apple's MIDI Manager. Consequently, you can play Sound Exciter or MacProteus from a MIDI keyboard or patch directly to it from most software. What's really amazing is that nobody ever thought of doing this before.

Combine MIDI and Digital Audio

MIDI does not deal with any real sound data, only the events that trigger sounds, and digital audio only deals with sound data, not MIDI event triggers. If you are beginning to wonder whether these breakthroughs will divide the Macintosh music community into two camps, digital audio versus MIDI, don't worry: the software bridging the gap between these two worlds is already here.

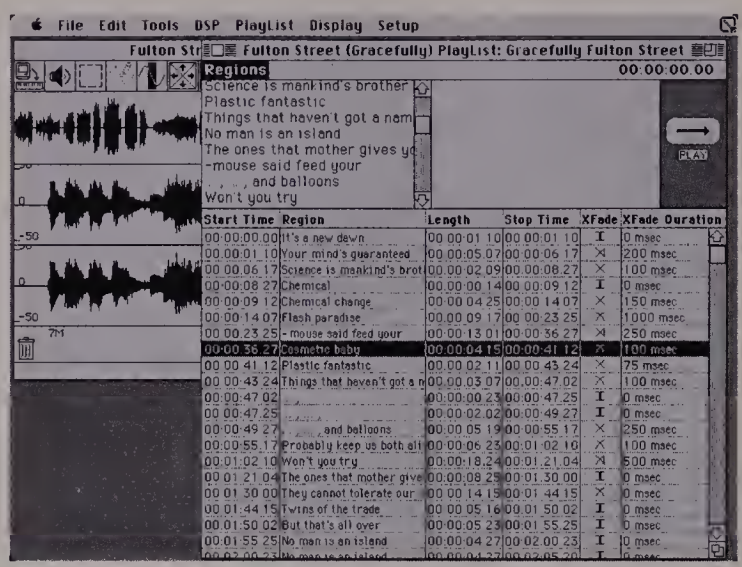
Unlike the products mentioned earlier in this article, Digidesign's Deck software provides for four tracks of digital audio along with 32 channels of MIDI data. The program resembles a portable four-track tape recorder, and if you have ever operated a cassette deck you may not need to read the manual. Deck is optimized for the Audiomedia board, although most of the program's functionality is available with the Sound Accelerator board (see "Virtual Four-Track").

Deck's separate EQ and DSP effects modules for each track mean that EQ plus one of four other effects can be applied to tracks individually. Deck supports time-honored recording studio practices like punching in and out, loop recording, and sound on sound, as well as unlimited digital track bouncing with no generation loss or signal degradation. Bouncing tracks refers to mixing down a group of tracks to a single track in order to free up their space for recording new material. With analog tape, this technique results in greater distortion with each bounce. Interestingly, when bouncing tracks with Deck you don't need to set aside an open track to bounce down to. Thus, all four tracks can be bounced down to a single track, or to two tracks for stereo, as if Deck were a six-track recorder.

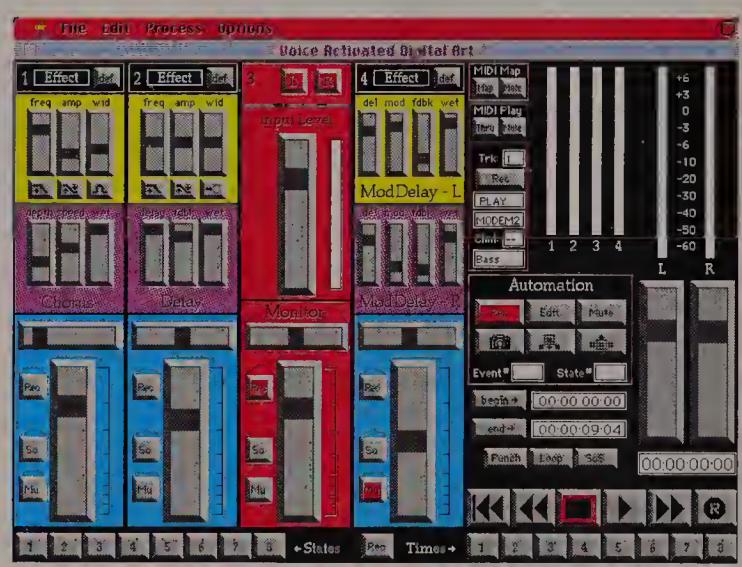
Deck's controls and faders may be mapped onto any MIDI controller or moved with the mouse. In either case, fader movements for volume, pan, EQ, and effects can be recorded for an automated mix down. This automation can be edited, and you can watch the faders move themselves on screen during playback.

Besides recording and playing back 32 channels of MIDI data together with digital audio, you can import and export data freely with any MIDI sequencer supporting the standard MIDI file format (nearly all do). However, if you want full-blown MIDI sequencer editing with digital audio tracks too, look at Opcode Systems' new StudioVision.

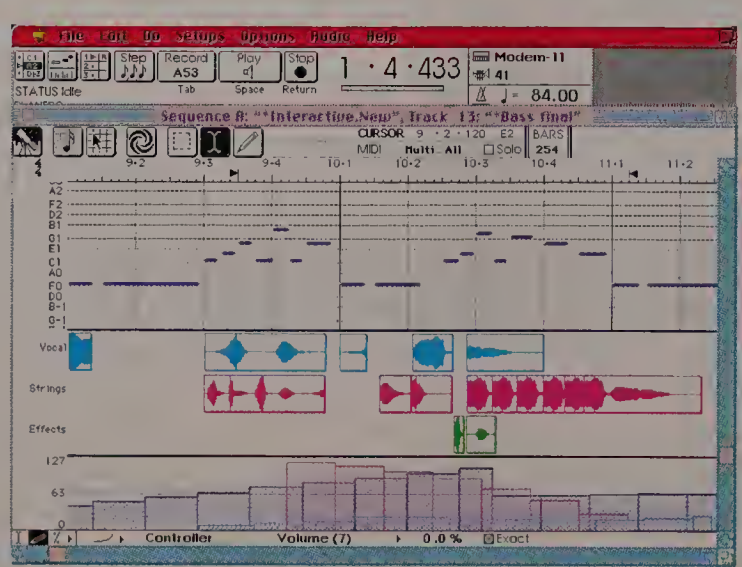
Opcode's revolutionary MIDI sequencer, StudioVision, is a Macintosh musician's dream come true (see "Vision of the Future"). With StudioVision, you can record up to 16 stereo digital audio tracks, although you can play back only two at once. StudioVision lacks the DSP features of dedicated hard disk recording programs,



They're Playing Our Song Sound Designer II and Audiomedia support an unlimited number of playlists for any sound file. A playlist is a map of the sound file that determines the way it will be played back. Because this is random-access audio, any number of regions may be played any number of times and in any order. All of this editing is nondestructive.



Virtual Four-Track If you have ever operated a four-track cassette deck, you won't have any problem with Deck's interface. Features include multiple effects on each track, moving fader automation, digital EQ, digital track bouncing and mixing, and simultaneous MIDI file recording and playback.



Vision of the Future Opcode's StudioVision combines the revolutionary Vision MIDI Sequencer with CD-quality direct-to-hard-disk digital recording and playback. Sixteen digital audio tracks are available although only two will play back at any one time. Color is used to associate controller information with the data it is applied to.

but it does support cutting, copying, and pasting of digital audio; MIDI-controllable volume and stereo pan faders; and merging of up to 16 tracks into a single track. It can intelligently separate a digital audio track into its component elements and *quantize* (apply rhythmic autocorrection) audio events to MIDI note events.

Although you can import regions and playlists from Sound Designer and Audiomedia, you hardly need to in StudioVision because you can achieve the same effect by Option-dragging a selection to copy it, just as you would in a graphics program. Like playlists, these copies of regions do not increase the size of the file. If you define a selection in StudioVision, there is a single menu command that transfers you to Sound Designer II with the new region selected.

Opcode is adding features to StudioVision daily, and this has not gone unnoticed by the competition. Mark of the Unicorn recently announced the imminent arrival of its entry into this market: Digital Performer.

Bring It All into Multimedia

You do not have to be a professional musician to use any of these tools. Anyone creating multimedia can greatly enhance their endeavors with any of the tools described in this article. Most of the current multimedia platforms are compatible with both digital audio and MIDI. HyperCard and SuperCard have the ability to drive simultaneous playback of audio and video. MacroMind Director can play interactive movies scored with either 16-bit stereo snd resources or disk-based sound files. The RAM overhead in the case of the Audiomedia board is a mere 50K. With Opcode's MIDIplay, Passport's HyperMusic, or EarLevel Engineering's HyperMIDI 2.0, you can enhance the MIDI aspects of these programs.

The fact that you don't read a note of music and can't carry a tune doesn't matter anymore, either, because there is a whole industry of clip music mushrooming around us for just this situation. Clip music—available as MIDI data, sound files on CD ROM, or CD recordings—is one way to avoid licensing fees for copyrighted tunes (see "Sorry, No Free Samples").

SORRY, NO FREE SAMPLES

If you use music to spiff up your multimedia presentations, you could be engaged in illegal activity. Although laws governing the recording of copyrighted material are very restrictive, recording for personal use is generally allowed. A slick presentation for the marketing department with Axel Foley running in the background is not considered personal use. The fair-use doctrine allows samples to be used for educational purposes or for literary commentary, but recording to a hard drive is still illegal because it is considered a mechanical reproduction.

The rule of thumb: If someone else's music is being used in your software—whether it's written into the program code or imported into a HyperCard, SuperCard, or MacroMind Director document—and the copyright holder isn't getting any royalty from it, you're guilty of copyright infringement.

If you don't negotiate a royalty in advance of the usage, you may be forced to pay a compulsory license fee that will require (1) the full statutory royalty, (2) monthly usage reporting, and (3) payment based on units manufactured rather than units sold. If you are laboring under the common impression that it is legal to use four bars or seven seconds of music, whichever is less, you are grossly mistaken.

Fortunately, copyright law does make a distinction between public and private exhibition. While it might cost $10,000 (or much more) to license a song for wide-scale use—in a motion picture, for instance—a one-shot use of the same song in a multimedia presentation at a board of directors meeting might cost well under $200.

As a general rule—until the year 2010, when new copyright laws come into effect—you can safely assume that any song written before 1915 is in the public domain. Sometimes you can get away with quoting a popular song if it happens to be based on a folk song. For example, "Love Me Tender" is really the public domain folk song "Aura Lee," although most people will think of Elvis Presley when you use an arrangement of it in your multimedia presentation. Nonetheless, there was a major court battle over "Yes, We Have No Bananas" because the first four notes are the same as those of Handel's "Hallelujah Chorus."

Sound Predictions

Desktop CD-quality audio is revolutionizing both the multimedia and the music industries. Although these boards are not even a year old, many of the self-running presentations at the two most recent Macworld Expos were based on Audiomedia or Sound Accelerator boards, and some were even using the MacProteus board.

It's really not hard to see where this is all leading—to the full integration of sample-editing and MIDI-sequencing software. We will surely see an increase in the number of tracks just as we did in the evolution of analog tape recording. Additional presentation tools will soon provide for audio—programs like Aldus Persuasion, Symantec's More 3.0, CA-Cricket Presents, and Microsoft Powerpoint—it's only a matter of time. Farallon, for instance, is reportedly on the verge of announcing a significant software release that will work with 8- or 16-bit sound. Now musicians can appreciate what graphic artists went through as 32-bit color became reality. You wake up every morning wondering if this is going to be the day when it all comes together. ■

See *Where to Buy* for contact information.

***Christopher Yavelow** is an award-winning computer-assisted composer based in Hollywood. IDG Books will release* Yavelow's Macintosh Music and Sound Bible *in early 1991.*

COLOR PRINTERS ARE BETTER THAN EVER. HERE'S A LOOK AT THIS YEAR'S GROUP.

Color Printers Here and Now

When *Macworld* looked at color printers last February, we found many things to like, but we found a few less-lovable traits as well. Color printer technology and the color printer market are both changing fast (we revised the prices in the features table four times in a single month). Prices are down, quality is up, and software problems are slowly dissolving. The range of color printers is still very wide; at one end you can get a low-cost (close to $1400) ink-jet printer that does a clean job of printing color text and simple graphics, while at the high end you can find a professional color-graphics printer that produces glorious, page-size, photo-realistic images, merely for the price of a roomful of Mac IIcxs.

Many of these printers came to our cozy Mac world from harsher, colder, Bluer environments, and their lack of software and interface manners may be taken occasionally for hostility. A promising sign is the prevalence of PostScript-based printers. Tolstoy remarked that all happy families are alike, but every unhappy family is unhappy in its own way. The Macworld Lab staff observed that all PostScript printers were easy to use and gave consistently good results, while every non-PostScript printer had problems with output in at least one application. This observation (about the printers, not the families) is particularly encouraging because one might thus legitimately hope that System 7.0 and TrueType will provide a scheme whereby these printers might be judged by their intrinsic capabilities rather than by the frequent deficiencies of their driver software (see "Systematic Printing"). Perhaps by mid-1991 Apple will have solved the driver problem for printer developers, or at least created a simpler problem.

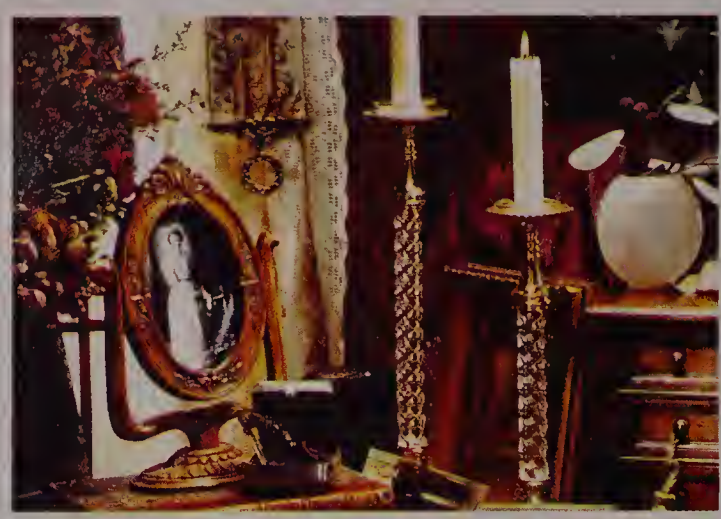
The printers that Macworld Lab tested were chosen according to a simple criterion: they were commercially available rather than just announced in late 1990. We found that the printers have many traits in common. I'll point out the appropriate applications for each type of printer based on output and suggest what changes you will see this year.

Liquid, Solid, Gas

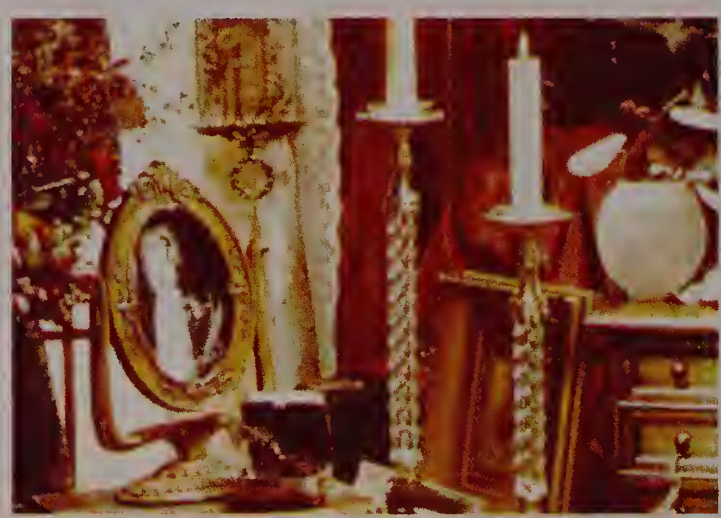
At room temperature there are only three states of matter, and all of them can be employed to bring color to the page. An ink-jet printer is mechanically the simplest, consisting only of liquid ink reservoirs and a piezoelectric nozzle for propelling microdroplets of this ink. In principle, the ink-jet printer could overlay these droplets to produce stunningly shaded colors. In real life, the ink has to be dense enough for vivid pure tones—overlaid drops would produce only mud. Color gradations in ink-jets are therefore represented by halftones or dither patterns, in which shades consist of closely spaced checkerboards of dots. Ink-jet vendors, keenly aware that picture quality depends strongly on their choice of dithering pattern, try to be flexible: the driver for the Sharp JX 730 includes 11 different dither patterns from which to choose.

BY CHARLES SEITER

The Seiko ColorPoint PS (left), the Tektronix Phaser PX (middle), and the Hewlett-Packard PaintJet Color Graphics Printer (right)



The Best of the Bunch If you don't think that color printers can produce nearly photo-realistic images, then take a look at a print from Kodak's XL 7700 dye-sublimation printer. But dye-sublimation printers don't currently support PostScript, text is very jagged, and the cost per page is high.



A Well-Rounded Solution On the other hand, thermal wax-transfer printers support PostScript, produce excellent text, and are cheaper per page to use. But the images (such as this one printed on the OcéColor), while good enough for presentations and proofing, just aren't as alluring as those from a dye-sublimation printer.

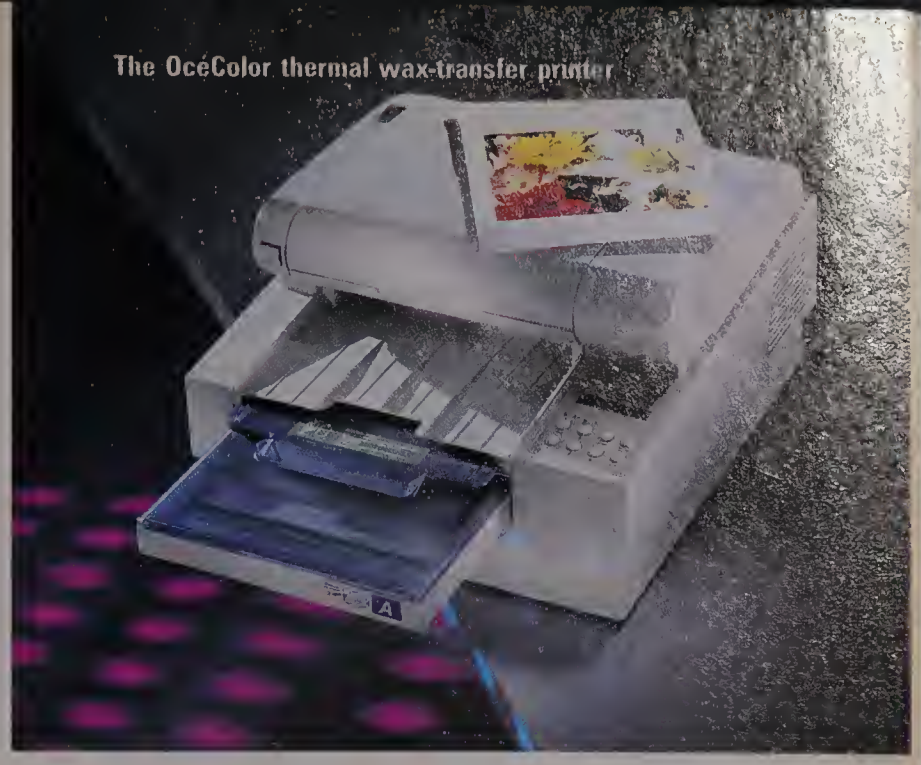
The QMS ColorScript 100 Model 30 thermal wax-transfer printer

Thermal wax-transfer printers use melted dots of solid, colored wax to create an image. The colored wax is transferred from thin sheets of cyan, magenta, yellow, and black wax film to paper, producing rich, enamel-like colored surfaces. To print continuously varying tones, thermal wax-transfer printers must use dithered halftone schemes. Thermal printers have two advantages over ink-jets, however. First, the Macworld Lab resolution test patterns show that when printing images with tight spacing, the thermal printer's semisolid dots are easier to control than are liquid ink dots. Second, the thermal printer mechanisms are expensive enough to warrant inclusion of PostScript. In the cases where a printer uses a custom halftoning algorithm rather than the default PostScript algorithm, the resulting photograph-like images are lovely. The Seiko ColorPoint PS provides an outstanding example of how well custom halftoning can work.

Dye-sublimation printers use colored translucent dye that can be mixed on the same pixel to create a different color, and thus deliver more photo-realistic images than either ink-jet or thermal wax-transfer printers do. As part of your general education, you should know that sublimation means the direct conversion of a solid to a gas (without a melted liquid state in between—dry ice evaporating is nearly the only common example) and is an ancient bit of alchemical terminology in modern science; to medieval researchers, a substance would "sublime" if it passed directly into ethereal form. Down in the mundane world of printers, a heating element releases as vapor little bits of dye from a dye sheet; this vapor reacts with specially coated paper. Since the colors are as transparent as cellophane, 300-dots-per-inch (dpi) resolution means 300 different little specks of nicely tuned color in a linear inch, rather than larger, lower-resolution chunks of dithered or halftoned colors. And these colors are indeed sublime; there's no comparing them with the colors from other types of printers (see "The Best of the Bunch" and "A Well-Rounded Solution").

Think Ink

All ink-jet printers share some characteristics. They're inexpensive enough that you won't get PostScript, so the vendor has to provide fonts for smooth text printing. The liquid ink these printers use provides a duller-finished printed surface and less-brilliant color when it dries than do thermal wax-transfer printers. For business presentations, this ostensible liability can become an asset; when projected, overhead transparencies of bar charts printed with more translucent inks can be more pleasing than those printed with denser, darker waxes.


The OcéColor thermal wax-transfer printer

The least expensive ink-jet printer is the HP PaintJet Color Graphics Printer from Hewlett-Packard, with a retail price of $1395 and a street price approaching $1050. As the timing results indicate (see "How Quickly Can They Print?"), the HP PaintJet is not a printer for the Macintosh user in a hurry (for best results on transparencies, it calls for two passes), but driven at its highest resolution, and with the outline fonts provided by Hewlett-Packard, there's simply no complaining about this device as a low-cost business-graphics engine. Its big brother, the $2995 HP PaintWriter XL, is much faster, more capable (it can handle 32-bit Color QuickDraw), and accepts more paper sizes. According to Macworld Lab test results, there are strong family similarities between the two printers' color ranges and in their use of odd, MacPaint-like dot-and-cross fill patterns to represent continuous gray scale (see "Almost Smooth"). Hewlett-Packard gets high marks for its exemplary documentation and complete packaging on both of these printers.

In contrast to the complete Hewlett-Packard packages, the Sharp JX 730 uses Computer Associates' Cricket Expression QuickDraw driver and either of two third-party parallel interface boards. Because so many pieces of the JX 730's setup are derived from third parties, you must spend considerably more time reading manuals and futzing with hardware than you do when setting up the Hewlett-Packard printers. But the JX 730 prints clean text and provides enough choices of dither patterns to allow a good ink-jet attempt at continuous-tone reproduction.

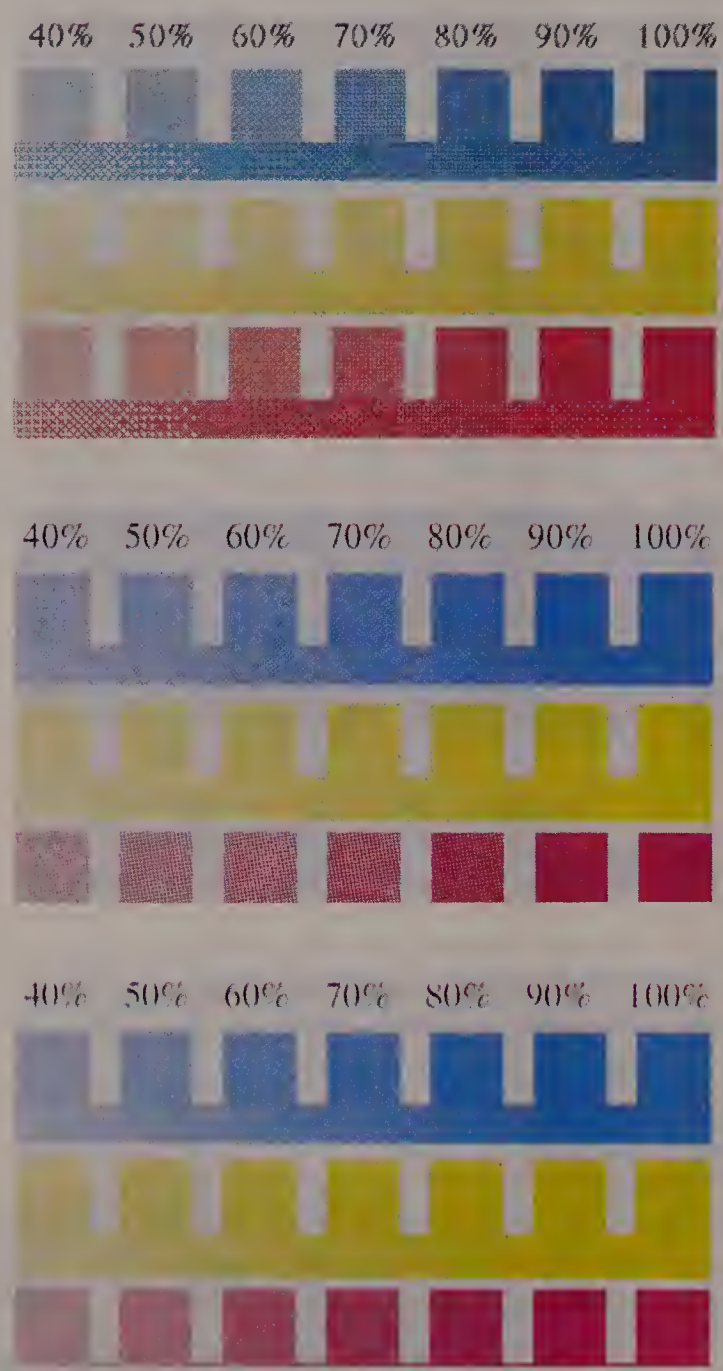
Tektronix's ColorQuick Ink-Jet Printer produced the most photo-realistic output among ink-jet printers, thanks to Tektronix's diligent efforts at matching printed output to screen colors and at developing a custom halftone scheme. (The Sharp JX 730 and the ColorQuick use the same Sharp engine.) The ColorQuick's colors are bright (and Tektronix offers software for calibrating them), and the gradations are smooth. The printer handles 24-bit color images without difficulty, and for an ink-jet, at least, it's quick (it uses the SCSI port instead of the parallel interface used by the Sharp or the standard Apple serial printer port used by the HP PaintJet). With both the JX 730 and the ColorQuick, ink handling provided some unpleasantness in the Macworld Lab—the reservoirs splashed a bit on setup and the jets clogged at first—but these problems diminish with routine

SYSTEMATIC PRINTING

Many of the printers have software deficiencies that System 7.0 promises to fix. QuickDraw-based printers, for example, produce unusably jaggy type for presentation overheads—unless the vendor provides custom fonts (the Hewlett-Packard solution) or unless you install Adobe Type Manager. With System 7.0's promised TrueType outline fonts, QuickDraw printers will be able to produce text at the printer's best resolution—assuming the printer vendors write drivers conforming to Apple's TrueType specifications. Although Apple may leave the details of color presentation (dither patterns, for example) up to the vendors, it is possible that Apple may define how 8- and 24-bit color should be represented.

These definitions may be modeled on PostScript, which is currently undergoing color-standard refinement. The standard angles at which halftone screens are printed in PostScript are derived from the printing industry's higher-resolution practice, and they work acceptably on commercial-grade systems. But these angles produce odd results in lower-resolution thermal wax-transfer printers. Different vendors take different ways around this problem. Océ Graphics' software includes a PostScript file to reset the default angles; this produces superior results on the Océ printer but is less suitable for color offset printing and isn't Pantone certified. Tektronix and Seiko use drivers that replace PostScript halftoning entirely. While the details are not yet settled, System 7.0 is likely to require printer-driver dialog boxes in which variations from a standard scheme can be set directly from a uniform set of buttons. Right now in this every-vendor-for-itself world, printouts often don't show the printers' optimal ability.

Mitsubishi Electronics America's S340 dye-sublimation printer



Almost Smooth Here's how three different printers perform when printing a color gradation. The HP PaintWriter XL (top) does an admirable job, especially considering its low price. The NEC Colormate PS (middle) handles gradations even better although not nearly as smoothly as the Seiko ColorPoint PS (bottom). The Seiko uses a custom dither pattern, while the NEC uses the standard PostScript dither pattern.

use. Test-pattern output with the ColorQuick was sometimes eccentric, showing odd variations in our 10 percent to 90 percent tone-density test (colors printed at 40 percent were clearly darker than those printed at 50 percent), but the transparency and picture output rivaled that of much more expensive thermal wax-transfer units.

Stacks of Wax

With a little fine-tuning, any one of the thermal wax-transfer printers tested could produce brilliant output. The resolution (usually 300 dpi) is excellent, and the colors are solid and bright (almost overwhelming on primaries). But at this stage of evolution most of these printers could stand a last few bits of polish.

At these prices ($5695 to $15,995) you might rightly expect a PostScript interpreter in the printer. Five of the thermal wax-transfer printers (those from Océ Graphics, QMS, Seiko, Tektronix, and NEC) use PostScript or are PostScript-compatible, and thus produce generally similar results when printing images with sharp boundaries or text. The printers that use standard PostScript—the OcéColor, NEC Colormate PS, and QMS ColorScript 100—produce output that shows a mild case of banding (see "Almost Smooth") and a severe case of doilies, an unkind reference to the little polygonal patterns that result when a color picture is printed with the PostScript default 6-by-6-dot halftone cell. (At press time, QMS sent us new software that includes additional, custom PostScript screen angles. QMS claims this will elminate the doilies.)

For reference, in conventional color printing, four colored grids of dots (one each for cyan, magenta, yellow, and black) are set at slightly different angles in order to prevent moiré patterns from cropping up when a printer misregisters the layers. This scheme works best at the high resolution (well beyond 300 dpi) of commercial color printers. The 6-by-6 PostScript dither blocks, on the other hand, give an effective resolution of 50 blocks per inch instead of the 300-dpi these printers are capable of printing.

In a bad case of doilies, a color picture looks as if it's being printed with small mud-colored doughnuts (see "Patterns in the Printouts"). Some vendors avoid the doilies by bypassing PostScript for a custom halftone algorithm optimized for the printer engine's ultimate capabilities; after all, if the printer can produce 300 tight color dots per inch, optimized driver software should produce near-photographic-quality prints. Both the Tektronix Phaser PX and the Seiko ColorPoint PS include custom halftoning that makes these printers' images stand out from the crowd (see "Patterns in the Printouts"). The Phaser output shown is particularly remarkable

THE NEW CHALLENGERS

State-of-the-art may soon be challenged by Iris Graphics' 3000 series of continuous-color ink-jet printers and Metrum Information Storage's Colorado Color Imaging Recorder high-speed dry-silver color-process printer.

Of the printers, the 3000 series has the most potential appeal to Mac users. The 3000 series printers (which use a custom, software-based PostScript interpreter) are expensive by Mac market standards (a shade under $50,000), but they provide an effective resolution of *1800* dpi—hence the name continuous color. Plus, you get a large-format print engine that has been tested and accepted for years in the color printing industry. Iris, a division of graphics-industry heavyweight Scitex, estimates per-page cost at only 46 cents. A less expensive, medium-format printer in the same series, called SmartJet, is also being readied.

The Colorado is an advanced printer capable of photographic-quality printing. It uses special silver-based paper and was originally developed for high-end markets such as medical diagnostics. The Colorado will cost approximately $10,500, and will be able to produce an A-size print in 30 seconds thanks to its SCSI interface. The quality and per-print cost (about $1.50) is comparable to that of a dye-sublimation printer. And since the Colorado is driven directly from screen RGB data, printed colors look like the colors on your screen.

for its clarity because the printer refused to perform at 300 dpi on our Adobe Photoshop match print, so the image was printed at 72 dpi. (Tektronix claims that when Photoshop sends a file to the printer, it expects a small buffer such as the one in a typical laser printer. Instead, it finds the Phaser PX's large, 1.5MB buffer, which slows down the printer's response time to an application's print request. The result is a "cannot communicate with printer" error message.) This glitch in the Phaser PX was the only serious anomaly we uncovered in testing thermal wax-transfer printers.

Tektronix and QMS are both trying to make their products acceptable to traditional color printing shops by calibrating printer output to the Pantone Matching System (PMS). Tektronix commissioned Pantone to create a custom color-lookup table for the Phaser series and relies on application software vendors to implement the table. QMS's large-format (11 by 17 inches) ColorScript 100 Model 30i uses direct Pantone certification: If you use a Pantone-licensed application (such as Adobe Illustrator, Aldus FreeHand and PageMaker, QuarkXPress, and a growing list of others), QMS guarantees color correspondence between the Model 30i's printed images and the final color-separated CMYK job as it comes back from a commercial printer. Printers from Seiko and Océ can generate Pantone test patterns from number codes; this trend will likely make Pantone certification mandatory for large-format printers serving the graphic arts market.

Some thermal wax-transfer printer manufacturers have deliberately held off including PostScript until Apple finalizes the specifications for its TrueType font technology. We tested two QuickDraw-based thermal wax-transfer printers—the G370-10 thermal color printer from Mitsubishi Electronics America (EA) and the CHC-445 from Mitsubishi International—that are similar to each other and distinct from the PostScript bunch (note: Mitsubishi EA and Mitsubishi International are two separate companies with confusingly similar names). QuickDraw does a pretty fair job of continuous-tone shading, but large-size text looks simply terrible unless you install Adobe Type Manager. With ATM, text clears up wonderfully, at last resembling the output you have a right to demand from units that cost more than a LaserWriter. Both products are slow compared to the other thermal wax-transfer printers, and both have software quirks that need to be fixed. The CHC-445, for example, cheerfully announces in a dialog box that it is printing a MacDraw II document, no matter what software created the document in question. The G370-10 allows you to invoke a quad-spiral dithering scheme (seen also with printers from Shinko), which produces better continuous tones than QuickDraw does.

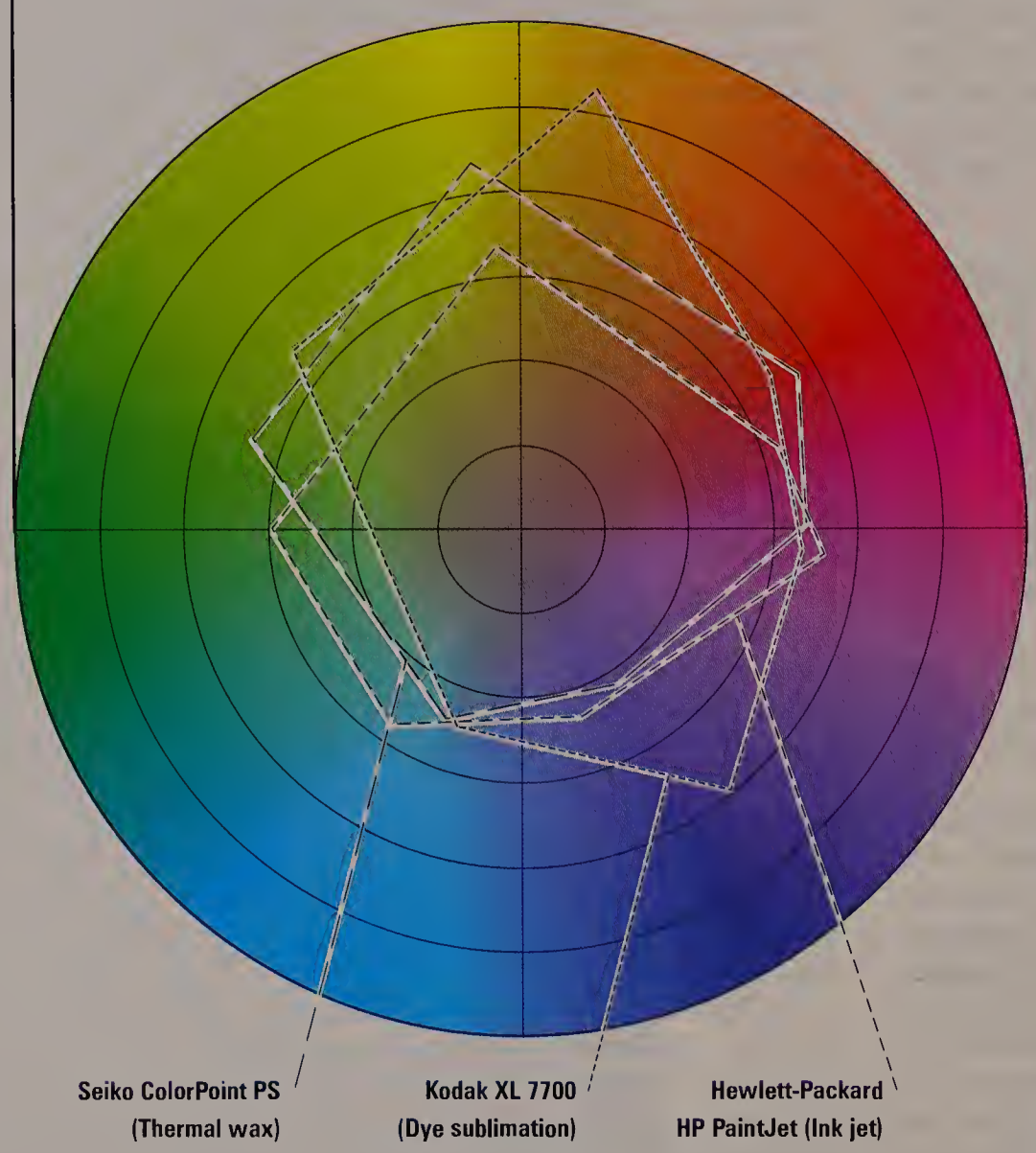
Color to Dye For

In dye-sublimation printers, the theme of "brilliant print engine, unfinished Mac interface" reaches a thundering conclusion. Both the Mitsubishi EA S340 and the Kodak XL 7700 produce striking photographic color images; in the case of the higher-resolution Kodak XL 7700, it is unlikely that this magazine's commercial printing technology can accurately reproduce the luminous, almost three-dimensional quality of these images (see "The Best of the Bunch"). The transparencies look even better, if that's possible. Most non-graphics-spe-

Printed Colors

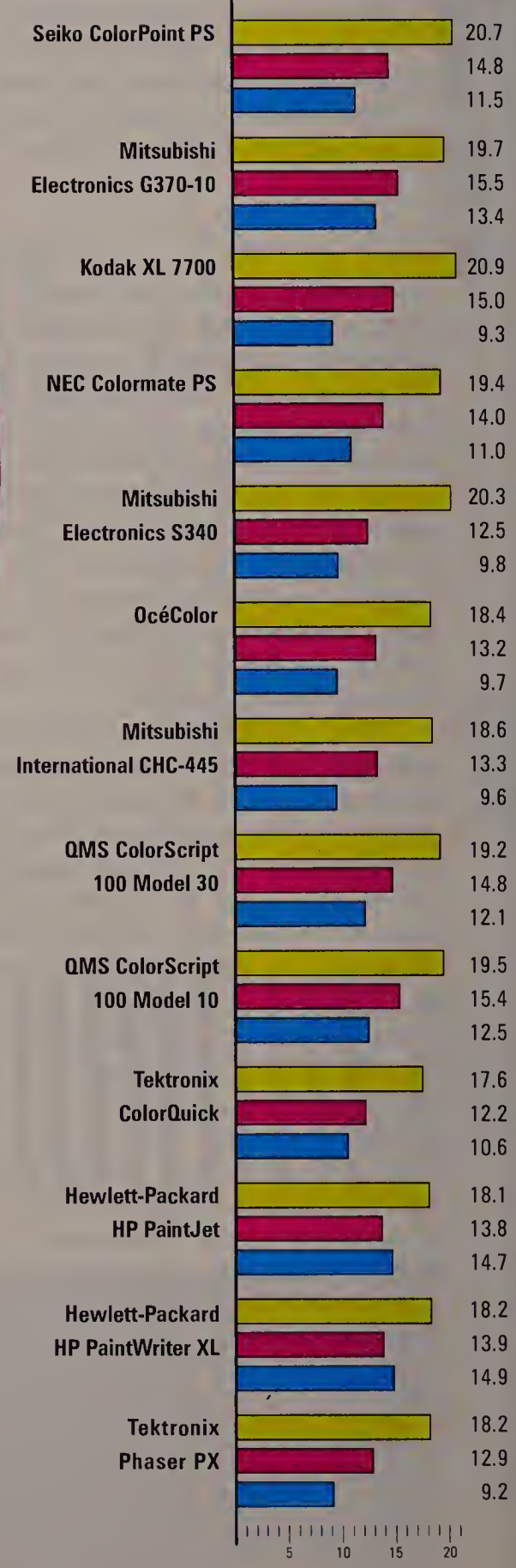
Color Gamut

This color gamut chart shows the range of printable colors from some selected printers: an ink-jet, a thermal wax-transfer printer, and a dye-sublimation printer. The range of a perfect color printer would extend over the whole chart.



Saturation

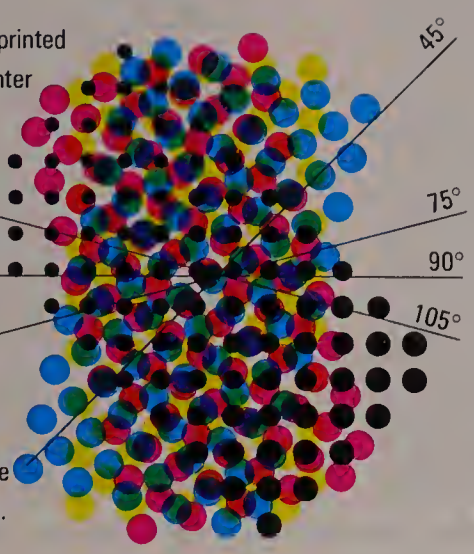
This bar chart shows saturation values for cyan, magenta, and yellow output. The higher the saturation, the richer the colors. Macworld Lab used a Minolta spectrophotometer to measure saturation.



ow You See Them

hermal wax transfer

you were to magnify the images printed a thermal wax-transfer color printer) times, this is what you'd see. hermal wax-transfer printers oduce colors by laying own angled grids of cyan, ellow, magenta, and black ots. These grids are called alftone screens. Some color inters use standard PostScript ngles, which can produce circular atterns; other color printers include ustom angles for smoother results.



Now You Don't

Dye sublimation

Dye-sublimation printers don't use halftone screens. Instead, these printers actually mix varying percentages of cyan, magenta, yellow, and black ink to produce a specific color. The resulting image looks much like a photograph— there are no patterns or visible dots of color. On the down- side, the special paper and ink required for these printers are quite expensive—a single print can cost nearly $5.

ow Quickly Can They Print?

tScript Printers

mes are in seconds

Presentation Graphic

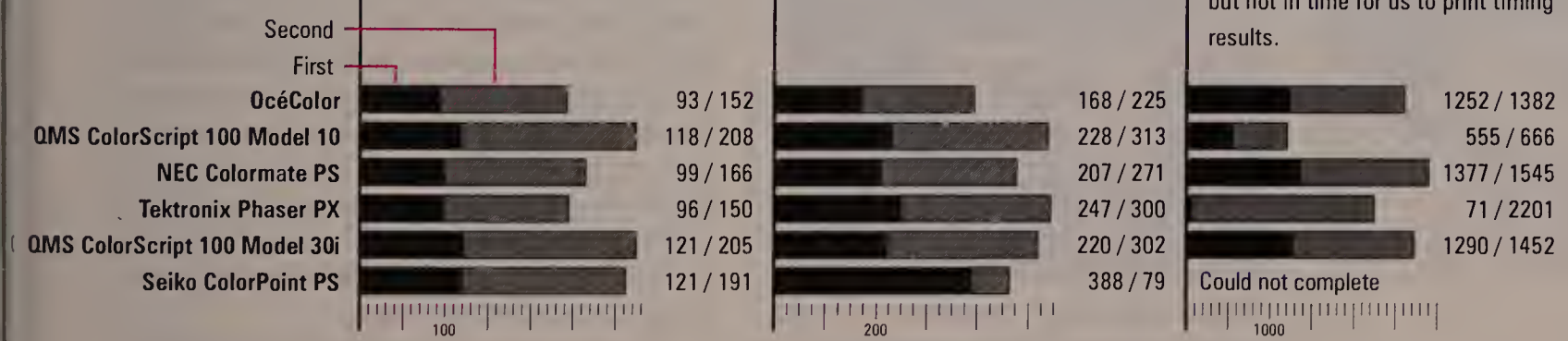
We printed a typical business-oriented bar chart from Aldus Persuasion. All the printers were fairly quick to print the first copy of the chart, but slowed when printing the second copy. Kodak's XL 7700 could not complete this test since its driver works only with Adobe Photoshop.

QuickDraw Graphic

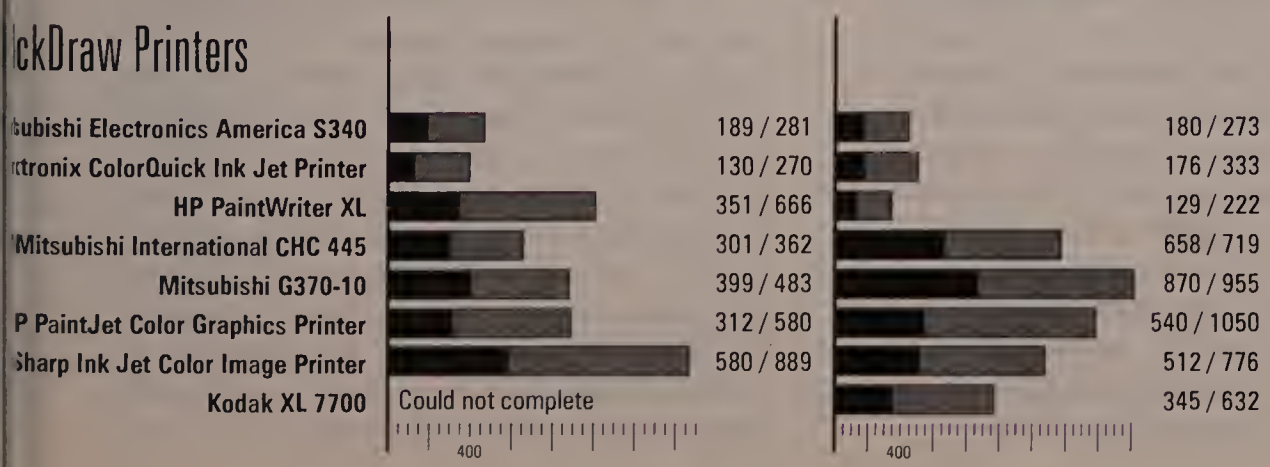
Next we printed two copies of a QuickDraw image created in Adobe Photoshop. Overall, the PostScript printers performed best, although three QuickDraw printers—the Mitsubishi Electronics America S340, the Tektronix ColorQuick, and the HP PaintWriter XL—ran as fast as the speedy PostScript OcéColor printer.

PostScript Graphic

Finally, we printed two copies of a complex PostScript graphic from Aldus FreeHand. Print times increased dramatically over those for QuickDraw images. (We didn't time the QuickDraw printers since printing PostScript images yields unpredictable results.) The Seiko ColorPoint PS could not print the image using the Better printing option—Seiko fixed the problem, but not in time for us to print timing results.



ckDraw Printers



COLOR PRINTERS COMPARED

	Ink-Jet				Thermal Wax Transfer		
Company	**Hewlett-Packard**	**Hewlett-Packard**	**Sharp Electronics Corporation**	**Tektronix**	**Mitsubishi Electronics America**	**Mitsubishi International**	**NEC**
Product	**HP PaintWriter XL**	**HP PaintJet Color Graphics Printer**	**Ink Jet Color Image Printer**	**ColorQuick Ink-Jet Printer**	**G370-10**	**CHC-445**	**Colormate PS**
Price	$2995	$1395	$2195 [2]	$2345	$5695	$5500	$8995
Amount of memory included	17.2K	8K	19K	256K	1MB	none	8MB
Options available [3]	ledger-size paper tray	none	T	T	none	none	SCSI
Type of interface [5]	S	S	P	SCSI	P	P, SCSI	S, P
Runs on AppleTalk	yes	no	no	no	no	no	yes
Maximum resolution (in dpi)	180	180	180	216	300	300	300
Dither cell size (in pixels)	8 by 8	2 by 2	8 by 8	16 by 16	[6]	8.1 by 10.3	5 by 5
Supports 32-bit QuickDraw	yes	no	no	yes	yes	yes	yes
Supports PostScript	no	no	no	no	yes	no	yes
Number of fonts included	28	28	35	35	NA	35	35
Optional fonts available	yes	yes	no	yes	yes	no	yes
Paper sizes	to 13 by 17.7 inches	A	to 16.5 inches	to ledger	A	A	A
Cost per A-size print	$1.40	$0.25	$0.28	$0.28	$0.60	$0.51	$0.60
Warranty (in days)	365	90	90	90	180	180	90
On-site service available	yes	yes	no	yes	no	yes	yes

[1] QMS just introduced a lower-cost ($12,995) version of the Model 30 called the Model 30i. The Model 30i's PostScript controller is contained inside the unit, making it cheaper to manufacture. [2] Price does not include parallel interface board and software driver. [3] T = tractor feed.

Patterns in the Printouts The QMS ColorScript 100 is one of several printers that use standard PostScript halftones. Upon close inspection, images printed with these halftones often appear to have been stamped with lots of small doughnuts, making the overall image muddy or washed out (left). Tektronix's Phaser PX uses a custom dither pattern to avoid the doughnuts and produce better output (top right). Seiko's ColorPoint PS also uses a custom dither pattern. We liked this one best of all—it produced the most detail in a very monotone, light-colored image (bottom right).

cialists who were shown the test prints flatly refused to believe that a computer printer could produce anything like them.

That's the good news on dye-sublimation printers. The downside is that producing high-resolution photographic-quality artwork is really all these printers can do conveniently, and at the stiff per-image cost of printing (approaching $5 a page in A-size) that may be all you want them to do. In a better world, you might expect that printers in the wild blue yonder (past $10,000) would toss in a PostScript driver for goodwill; in the real-world state of dye-sublimation printers, the $13,535 Mitsubishi S340 prints rich, clear, colorful, jaggy QuickDraw text like the world's finest ImageWriter I, unless you scrounge up a copy of ATM and load it (even then, text still isn't laser clean). The Mitsubishi also showed other software problems, printing clear bands instead of shading around blocks of text in a transparency print and dropping out rotated text from another image. Like its Mitsubishi EA relatives in the thermal wax-transfer category, this printer will benefit from a System that ameliorates these application-specific anomalies.

For about twice the money, Kodak will sell you a dye-sublimation printer with twice the resolution and its own set of software anomalies. With our review model, files had to be printed through a special module for Adobe Photoshop—there's no PostScript driver yet—so we couldn't complete the standard test sequence. The printer wouldn't spool images, and worked only by exporting files through an XL 7700 software module via a factory-configured (GP-IB or RS-232) hardware connection. The module is quite useful, enabling you to set

Océ Graphics	QMS	QMS	QMS	Seiko	Tektronix	Eastman Kodak	Mitsubishi Electronics America
OcéColor	ColorScript 100 Model 10	ColorScript 100 Model 20	ColorScript 100 Model 30 [1]	ColorPoint PS	Phaser PX	XL 7700	S340
$8990	$8995	$12,995	$15,995	$6999	$7995	$24,895	$13,535 [2]
5MB	5MB	4MB	8MB	6MB	6MB	12MB	6MB
add'l mem. to 8MB	add'l mem. to 8MB	hard drive [4]	none	add'l mem. to 34MB	4MB	paper catcher	none
S, P	SCSI, S, P	S, P	S, P	S, P	S, P	GPIB/IEEE	P
yes	yes	yes	yes	yes	yes	no	no
300	300	300	300	300	300	300	300
5 by 5	5 by 5	5 by 5	5 by 5	8 by 8	5 by 5	NA	NA
yes	yes	yes	yes	yes	yes	yes	yes
yes	yes	yes	yes	yes	yes	no	no
35	35	35	35	35	35	none	35
yes	yes	yes	yes	yes	yes	no	yes
A	A	A	A, ledger	A	A, legal	11 by 11	A, legal
$0.60	$0.68	$0.56	$0.56	$0.55	$0.40	$3.85	$4.80
365	90	90	90	90	90	90	180
yes	yes	yes	yes	yes	yes	yes	no

[4] Can also upgrade to Model 30 for $3495; Model 30 includes a hard drive. [5] P = parallel, S = serial. [6] Supports three sizes: 4 by 4, 6 by 6, and 8 by 8.

saturation and hue values directly (and save them to a configuration file) and to choose a Size to Fit option to accommodate paper up to 11 by 11 inches. You must use the Size to Fit option with Photoshop; otherwise the Kodak XL 7700 prints brilliant images the size of a large postage stamp.

Kodak realizes that more interface work is needed to make this magnificent device a convenient Mac tool. At this writing, a proper Chooser-level driver is promised for January, with PostScript Level 2 (continuous-tone scale, PostScript hue and saturation control) as the software base. A SCSI interface and server capabilities are also promised. Concerning a final development with great potential for improving print speed, Kodak representatives slyly note that their firm is a leader in JPEG image compression and decompression; if Kodak can get a networked printer to deal directly with compressed files, throughput speed could be greatly improved. Since it sells printer imaging paper at several dollars per sheet, Kodak is probably uniquely motivated to solve dye-sublimation printing speed problems.

Colors on the Horizon

Of the three printing technologies, ink-jets are the most mature and show what can be accomplished with a few years of steady development. The ink-jets are best suited to presentation graphics; the most popular models are used for producing A-size transparencies and color graphics for business reports. The HP PaintJet is inexpensive, easy to use, and certainly good enough for most presentation-graphics; the other ink-jets squeeze more results out of the technology but with an increase in physical or software-configuration complexity.

The most sophisticated thermal wax-transfer printers produce output close in quality to that of conventional color printing. Wax printers are the best current choice for graphics shops. B-size printers are even available for printing color proofs. The Tektronix Phaser PX and the Seiko ColorPoint PS produce sharp text and smooth color shading and are the price-to-performance champions; watch this area closely, though, if you are serious about color graphics, because prices are changing rapidly, and simple software upgrades can make a major difference in output quality.

Finally, it may be said that the bridge is still under construction between the Macintosh domain and the glowing, sophisticated realm of dye-sublimation printing. You can make the trip now if you don't mind the rickety construction, but unless you have a pressing graphics need you may want to wait until the job is more finished. Parts of the technology (image compression, PostScript Level 2) to make either the Kodak or XL 7700 Mitsubishi Electronics S340 printers optimally useful are still in development, and more-refined products will likely appear in the year ahead. With healthy sales figures on all color printers, and with frequent rounds of price cuts, you may be printing in color sooner than you think. ■

See *Where to Buy* for contact information.

Contributing editor **Charles Seiter** *has been testing printers for* Macworld *for five years. He is currently developing color-imaging applications in analytical biochemistry.*

AN UPDATE ON MAC TOOLS THAT LET YOU CREATE AND EDIT PROFESSIONAL-QUALITY VIDEO PRODUCTIONS

Mac Video, Take II

Judging by the constant stream of product announcements from video hardware and software vendors, you'd think that television production couldn't survive without the Macintosh. While it's true that video products for the Mac continue to bring new capabilities at lower cost, the potential for Mac applications in broadcast television remains largely untapped. In this article, we'll fill you in on what's happened since our last report (see "Prime-Time Video," *Macworld,* September 1990), and we'll let you know what's still missing from the Mac video equation.

Video Production

Back in the 1950s, when live broadcasting was the rule, whatever transpired in the television studio went out over the air—sometimes with embarrassing results. Directors were restricted to two or three camera angles, and special effects were crude by modern standards. (Some critics feel that these limitations made for better television, but that's another subject entirely.)

Nowadays, aside from newscasts and sporting and other special events, most TV shows are recorded in advance for later broadcast. All the work that goes on after the action has been filmed or videotaped is called *postproduction,* an intricate process that involves combining the various elements into a finished production. Although it's not always obvious to the viewer at home, a television program consists of hundreds of short *sequences,* or shots, spliced together. The editor—whose work can make or break a production—is responsible for choosing the shots that best convey the story. In addition, he or she must also ensure that the *cuts*, or transitions, between sequences are smooth and don't distract the audience.

Because techniques for film editing are well established, most television editors still work with film, transferring the final product to tape for broadcast. Faced with tighter production budgets, though, producers are turning to videotape to save on processing and other costs. But videotape

BY PETER S. MARX & FRANKLIN N. TESSLER

David K. Allison is the chief curator of the Smithsonian's National Museum of American History exhibit, Information Age: People, Information, and Technology. Using Macintosh video technology to develop and display on-screen presentations, the exhibit traces the evolution of telecommunications.

TOM WOLFF

presents editors with a whole new set of problems. Film consists of a strip of individual pictures, so it's relatively easy to locate the precise frame for a cut. In fact, movies are edited by actually clipping and splicing many short pieces of film. Since video pictures exist only as magnetic signals, videotape has to be edited electronically.

To let television editors edit video with the same precision as film, the industry has developed a code for uniquely identifying every frame in a video sequence. Dubbed *SMPTE timecode* after the Society of Motion Picture and Television Engineers that devised it, the scheme uses a separately recorded signal that identifies each frame on the videotape. This code allows videotape editors to work on a frame-by-frame basis, a process known as *frame-accurate editing*. Frame accuracy is an essential feature in any video product intended for broadcast applications.

Pictures, of course, tell only half the story. Postproduction also entails adding sound to the action. Just as the final video track usually includes action from many different sources, the audio track usually combines multiple individual sound tracks.

Sometimes everything the viewer hears, including dialogue, is added in postproduction. In a process called *automatic dialogue replacement* (ADR), actors watch themselves on film, or videotape, and re-create their speaking parts on a new audio track. Sound effects and music are recorded on still other tracks. Finally, the individual sound tracks are put together on a single audio track that is synchronized with the picture.

So video postproduction is really a two-stage affair. In the first step, the editor chooses the sequences that go together to make up the final program. As you'd expect, editing usually involves a lot of experimentation to discover what works and what doesn't. In the final step, the individual shots are seamlessly combined into a complete production.

For high-end applications, the final postproduction process is usually accomplished using expensive online editing systems like the CMX-6000, which can read the *edit lists* that specify timecoded start and end points for all the sequences in a program. Rental costs for such online facilities can be prohibitive, however—often several hundred dollars an hour. As a result, editors usually do their rough, experimental work using less expensive equipment. That's where the Mac comes in.

WOE WORLD PHOTOS

Unique Film and Video's *Kill All the Lawyers* is the first feature-length film to be edited using a Macintosh-controlled Avid system. Seated left to right are Ron Senkowski, director; Christa Kindt, editor; and Shannon Hamed, producer.

Mac the Editor

In order to automate the editing process, it's necessary to use computer-controlled video decks like Sony's U-matic. More costly than their consumer counterparts, these video recorders typically cost upwards of $5000 and make frame-accurate editing possible by incorporating SMPTE timecode capabilities. NEC's $2100 PC-VCR (formerly called Comboy) is a newer, less-expensive SuperVHS (S-VHS) video deck that also features a built-in RS-232C serial port. You can attach the PC-VCR directly to the Macintosh. The PC-VCR also permits frame-accurate editing by allowing users to add timecode information to previously recorded VHS videotapes.

An alternative video source that's increasing in popularity is the videodisc player. Unlike videotape decks, which record and play back video sequentially, videodiscs are random access devices, much like computer hard drives. Unfortunately, videodiscs can't be erased and rerecorded as videotape can.

Products designed to work with video decks and videodisc players under Mac command are known as *edit controllers*. Far less expensive than traditional systems, such as the CMX-6000, Mac-based edit controllers—Avid Technology's Avid/1 Media Composer and Digital F/X's Video F/X, for example—are designed for professional editors working in corporate video departments, and these Mac-based products can manage the inserting and dubbing needed to produce a video program.

The $10,000 Video F/X system consists of an outboard controller box for managing video equipment and a NuBus board for encoding and decoding NTSC (National Television Standards Committee) and RGB (red, green, blue) video. (Remember that television video signals use NTSC, which is different from the RGB video used on the Mac.) Video F/X requires a II-series Macintosh with 8MB of memory and a 40MB hard drive, along with a video monitor and two video decks, or one video deck and one videodisc player. Using Video F/X software, you create a series of video clips, represented by small pictures showing the first frame in each clip. You can assemble the clips in any order and specify fade-ins and fade-outs. Once the video sequences have been laid out, Video F/X assembles the final videotape for you.

One feature unique to Video F/X is its support of PostScript fonts and graphics. The system can render any encapsulated PostScript (EPS) or PICT file on video; it also lets you add *antialiased* text—text that displays smoothly on video—to a video presentation (see "Text without Jags"). Narration and background music can be recorded and combined with the audio track from the source video.

In the Avid/1 system (around $60,000), source video and audio are digitized in real time and stored on disk. So users can access images quickly during editing, the Avid/1 displays low-resolution, 8-bit digitized images on screen. Individual frames can be selected, trimmed, and assembled into a rough edit. After editing, the Avid/1 sends the true-color versions of those 8-bit images to videotape.

The Video F/X and Avid/1 are fine for in-house video production. But they lack the complex transition effects and control options you find now in high-end editing systems, and are therefore unsuitable for online broadcast work. However, both systems are capable of producing industry-standard edit lists for use in professional postproduction facilities. That allows you to do a rough edit of a presentation on the Mac-based system and perform the final assembly on a high-end editing system.

Video Cut and Paste

Not everyone's video-editing needs are as complex as a broadcast editor's or a corporate-video editor's. For people with more modest requirements and budgets, there's NEC's PC-VCR and video software from Light Source. Light Source's Multimedia Toolkit allows Macintosh users to control the PC-VCR directly from within HyperCard stacks; it's available from NEC for $149. A more full-featured Light Source video software package offers the Video Logger, which clips video segments by choosing in- and out-points on the video, and the Video Sequencer, a time-line editor that assembles video segments to create an edited videotape. NEC sells that bundle, which also includes the Multimedia Toolkit and a desk-accessory remote PC-VCR controller for $295.

Other specialized products are available for use with specific applications or particular equipment. For example, the DQ-Animaq Desktop from Diaquest and Advanced Digital Imaging's MacVac are two Mac II boards that each control frame-accurate videotape recorders. They enable animators to create videotapes frame-by-frame from applications such as MacroMind Director. Both DQ-Animaq and MacVac come in two versions—one with a serial port and another with serial and parallel ports.

If you're interested in just con-

trolling playback and recording of a video source, other products are available. Video Master from VENT is a hardware box that allows Mac owners to control videotape decks, CD ROM drives, and videodisc players via built-in infrared remote controls. It connects to the Mac's serial port. Designed to control only video devices, Video Master doesn't provide functions like video display, overlay, and special effects.

The VidClip VideoTape Control Toolkit for HyperCard from APDA contains a set of tools designed to enable HyperCard developers to write stacks that control Sony consumer videotape equipment. An equivalent product for controlling videodisc players, The Voyager VideoStack, comes from The Voyager Company. Apple also provides a videodisc player control system, the HyperCard VideoDisc Toolkit, that's similar to The Voyager VideoStack.

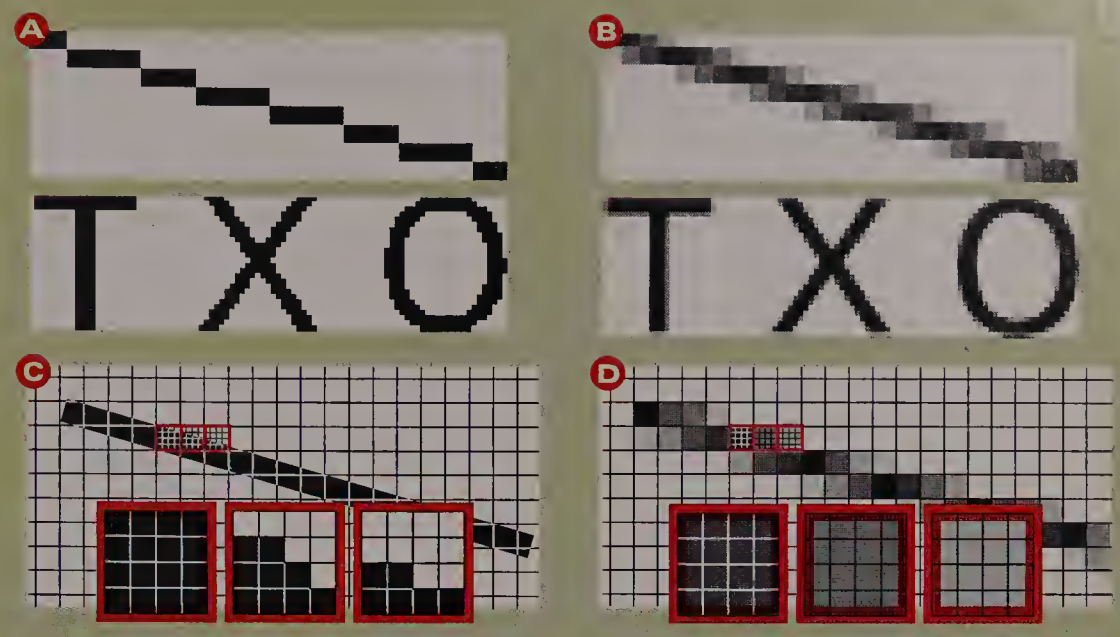
Here's Looking at You

Currently the Mac can't record and store live video to hard drives. But even if you can't record and store live video on a hard drive, you can record and store single images (or frames) from video cameras, video decks, and the like. A variety of *frame-grabber* boards from numerous vendors are designed specifically to digitize still images from video for display on the Mac screen. For more information about frame-grabbing and Mac video output, see "Prime-Time Video" in *Macworld,* September 1990.

Some boards, such as Mass Microsystems' ColorSpace FX (when used in conjunction with the ColorSpace IIi), the RasterOps ColorBoard 364, the RadiusTV from Radius, Aapps's DigiVideo Color, and the QuickView Studio from E-Machines, enable you to see live video in a Mac window. You can then take advantage of the boards' frame-grabbing abilities for capturing key images.

Once you've captured an image, there are several things you can do. You can send the graphic as-is to videotape via an encoder/decoder. Encoder/decoders are usually external devices that convert video from one format to another—most commonly Mac RGB to NTSC.

Text without Jags



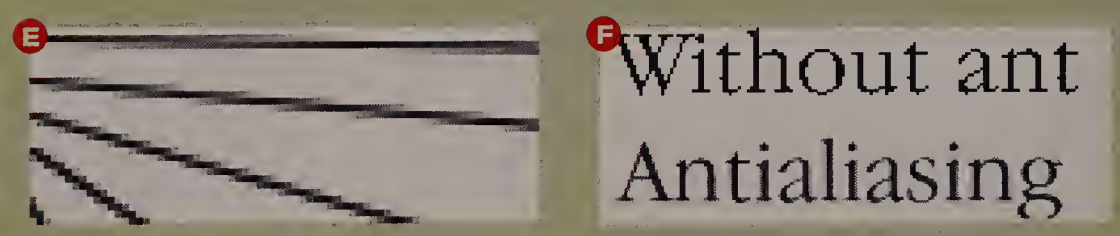
In Mac video, it's often useful to record images directly from the Mac screen. Unfortunately, Macintosh-generated text and lines can look terrible on videotape, due to flicker caused by the high contrast between the lines and letters and their background.

Diagonal lines and letters look jagged and have a characteristic stair-step pattern when moved to video **(A)**. This is due to the differences in resolution between the Mac screen and the NTSC video standard; pixels that used to fall into place on a Mac screen don't fall accurately on a video screen.

Antialiasing alleviates jags and stairsteps by blending the colors of letter and line edges with the color of the background **(B)**. To determine the blend for a diagonal black line on a white background, the antialiasing algorithm first makes the line four times larger than it really is, so that each pixel actually becomes a 4-by-4 grid **(C)**. Then, the algorithm examines each of the 16 areas for each pixel and compares the color fill of each area to the ideal edge of the diagonal line. The color and /or intensity of an individual pixel depends on the percentage of pixel areas on the ideal edge of the line. As a result, a pixel that falls only 10 percent on the ideal line becomes 10 percent of the line's color, a pixel 50 percent on the ideal line becomes 50 percent, and so on **(D)**.

You can see the differences in antialiasing that occur with diagonal lines of varying angles **(E)**. Notice that the horizontal line requires no antialiasing. You can also see the difference antialiasing makes in smoothing Mac-generated text in large type sizes **(F)**.

VideoQuill from Data Translation is a specialized program designed for removing jagged edges and flicker from video-recorded titles. Or, you can turn to Adobe Photoshop or Time Arts' Oasis, general-purpose image processing applications, which provide smooth-looking text not only for video recording, but also for computer displays.



Another thing you can do is to manipulate the image. To create special effects and overlays, you can take advantage of overlay and effects capabilities offered by some Mac add-in boards. For example, the $2495 QuickView Studio lets you digitize up to two video sources in 16 bits and view them simultaneously on the Mac screen. Text and graphics can be overlaid on the video signal, and special effects like flips and spins can be created in real time. The processed images are exported into applications like MacroMind Director.

Likewise, boards such as the ColorSpace FX and Workstation Technologies' WTI-Moonraker are designed to combine video with Mac graphics for subtitles and other graphics effects. Truevision's NuVista+ includes a *digital chroma keyer,* which enables you to dynamically merge live video with computer-

Product	Company	List Price	Minimum Configuration	Edit Control	Image Capture	Display	Video Overlay/ Video Effects	Encoder/ Decoder	Device Controller
Avid/1 Media Composer	Avid Technology	$59,000+	Mac II	●	●	●	○	○	○
ColorBoard 208	RasterOps Corporation	$495	Mac II	○	○	●	○	○	○
ColorBoard 264	RasterOps Corporation	$745	Mac II	○	○	●	○	○	○
ColorBoard 364	RasterOps Corporation	$1995	Mac II	○	●	●	optional	○	○
ColorCapture	Data Translation	$2995	Mac II	○	●	○	●	○	○
ColorSnap 32	Computer Friends	$995	Mac II	○	●	○	○	○	○
ColorSnap 32+	Computer Friends	$995	Mac II	○	●	○	○	○	○
ColorSpace FX	Mass Microsystems	$3499	Mac II, ColorSpace IIi	○	●	●	●	○	○
ColorSpace IIi	Mass Microsystems	$2299	Mac II	○	●	●	●	○	○
ColorSpace Plus/SE	Mass Microsystems	$1895	Mac Plus or SE only	○	○	○	●	○	○
ComputerEyes	Digital Vision	$249.95	Mac 512KE	○	●	○	○	○	○
ComputerEyes Professional	Digital Vision	$449.95	Mac II	○	●	○	○	○	○
DigiVideo	Aapps Corporation	$595	Mac II	○	●	●	○	○	○
DigiVideo Color	Aapps Corporation	$995	Mac II	○	●	●	●	○	○
DisplayServer-TV	Lapis Technologies	$79	Mac SE only	○	○	●	○	○	○
DQ-Animaq Broadcast	Diaquest	$3250	Mac II	○	○	○	○	○	●
DQ-Animaq Desktop	Diaquest	$3750	Mac II	○	○	○	○	○	●
DT2879-60Hz	Data Translation	$1495	NA	○	○	○	○	●	○
DVA-4000/Macintosh	VideoLogic	$2995	Mac II	○	●	●	●	○	○
Edit Worx	Specialized Computer Systems	$3495	Mac II	●	○	○	○	○	○
FrameGrabber 324NC	RasterOps Corporation	$1495	Mac II	○	●	○	○	○	○
HyperCard VideoDisc Toolkit	APDA-Apple Computer	$40	Mac Plus	○	○	○	○	○	● (videodisc)
IMTX 8000	Interactive Media Technologies	$7000+	Mac II	●	○	○	○	○	○
Image Capture Board	Scion Image Systems	$1095–$1995	Mac II	○	●	○	○	○	○
Light Source Multimedia Toolkit	Light Source/NEC	$149	Mac Plus	○	○	○	○	○	● (PC-VCR)
Light Source Software for NEC	Light Source/NEC	$295	Mac Plus	●	○	○	○	○	● (PC-VCR)
Macintosh Display Card 4•8	Apple Computer	$648	Mac II	○	○	●	○	○	○
Macintosh Display Card 8•24	Apple Computer	$799	Mac II	○	○	●	○	○	○
Macintosh Display Card 8•24GC	Apple Computer	$1999	Mac II	○	○	●	○	○	○
Mac Video Color Card	VENT	$599	Mac II	○	○	●	○	○	○
MacVac	Advanced Digital Imaging	$3000	Mac II	○	○	○	○	○	●
MacVac-S	Advanced Digital Imaging	$1495	Mac II	○	○	○	○	○	●
MacVision	Koala Technologies	$499.95	Mac Plus	○	●	○	○	○	○
MacVision Color	Koala Technologies	$699.65	Mac Plus	○	●	○	○	○	○
MicroTV	Aapps	$395	Mac II	○	●	●	○	○	○
Neotech Image Grabber	Advent Computer Products	$1499	Mac II	○	●	○	○	○	○
NTSC Converter	Specialized Computer Systems	$699	NA	○	○	○	○	●	○
NTSC VIDI/D Box	Truevision	$995	NA	○	○	○	○	●	○
NuVision	Perceptics Corporation	$26,000+	Mac II	○	●	●	○	○	○
NuVista+	Truevision	$2995–$4795	Mac II	○	●	●	●	○	○
PC-VCR	NEC Technologies	$2100	Mac Plus	●	●	●	○	○	○
Personal Vision	Drange Micro	$1499	Mac II	○	●	○	○	○	○
PixelGrabber	Perceptics Corporation	$1720	Mac II	○	●	○	○	○	○
ProVideo 32	RasterOps Corporation	$1995	Mac II	○	○	●	○	●	○
QuickCapture	Data Translation	$2995	Mac II	○	●	○	○	○	○
QuickImage 24	Mass Microsystems	$995	Mac II	○	●	●	○	○	○
QuickView Studio	E-Machines	$2495	Mac II	●	●	●	○	○	○
RadiusTV	Radius	$2795	Mac II	○	● [1]	○	○	●	○
RGB/Videolink 600A	RGB Spectrum	$9995	NA	○	○	○	○	●	○
TV Board	Generation Systems	$595	Mac II	○	○	●	○	●	○
TV Box	Generation Systems	$395	Mac Plus	○	○	○	○	●	○
TV Producer-Pro	Computer Friends	$1099	Mac II	○	○	○	●	○	○
TV Producer-RGB	Computer Friends	$1599	Mac II	○	○	○	●	○	○
VidClip VideoTape Control Toolkit	APDA-Apple Computer	$199	Mac Plus	●	○	○	○	○	○
Video Explorer	Intelligent Resources	TBA	Mac II	○	○	○	●	○	○
Video F/X	Digital F/X	$9995	Mac II	●	●	●	○	○	○
Video Master	VENT	$599	NA	○	○	○	○	●	○
Video NTSC Encoder	Computer Sciences Corporation	$300	NA	○	○	○	○	●	○
VideoDesk 1/24	Computer Sciences Corporation	$5795	Mac II	○	●	●	○	○	○
Video Image 1000	Scion Image Systems	$1095	Mac II	○	●	●	○	○	○
Video Image 1200	Scion Image Systems	$1295	Mac II	○	●	●	○	○	○
Video Image 1500	Scion Image Systems	$1495	Mac II	○	●	●	○	○	○
Video Image 2000	Scion Image Systems	$1995	Mac II	○	● [2]	●	○	○	○
The Voyager VideoStack	The Voyager Company	$99.95	Mac Plus	●	○	○	○	○	○
VTI Videoluker	Workstation Technologies	$2785	Mac II	○	●	○	○	○	○

[1] Digitizes audio; captures close-captioned information. [2] Digitizes audio.

generated graphics. The DVA-4000/Macintosh from VideoLogic and Intelligent Resources' Video Explorer, feature custom silicon chips that enable the boards to perform not only standard video effects such as fades, wipes, and dissolves, but also more sophisticated effects—zooms, pans, mosaic effects, and so on.

The View down the Road

So what's missing? Expensive systems like the Video F/X and Avid/1 are still too limited for most broadcast productions. And no Mac-based system as yet provides the resolution broadcast editors need for digital images.

There is no question that the Mac will be up to the demands of broadcast video postproduction. It will eventually be able to record, edit, and play back broadcast-quality video, and it will eventually be used in Hollywood. When it gets there, though, the rules may have changed.

Sometime during the course of the next five to ten years, television and video in the United States will be replaced by a newer system called *high-definition television* (HDTV). With twice the number of scan lines and a wider picture, HDTV images rival movies in impact.

Compared to NTSC video, HDTV is much more compatible with computer graphics. Frame-grabbers for NTSC usually produce only 640 by 480 pixels with 16 bits of color. HDTV provides a resolution of 1920 by 1035 pixels with 32 bits of color at higher frame rates than normal TV. That greatly reduces the annoying flicker that results when computer images are transferred to video. With many more pixels making up each frame, however, HDTV places an even greater strain on processing equipment.

One studio in New York, the Rebo High Definition Studio, is already experimenting with HDTV on the Mac. Rebo's product, the ReStore, permits storage, retrieval, and manipulation of HDTV images in real time. While HDTV equipment is not expected to be on store shelves for at least three years, the ReStore is available now for about $40,000.

The motion picture and TV industries are a strange combination of new and old. State-of-the-art dubbing stages and Digital Audio Tape recorders exist side by side with Moviolas designed in the 1920s. Sound editors often create fades by rubbing alcohol directly onto the magnetic stripe containing the audio recording. Film is spliced by hand using nothing more than tape and razor blade. Perhaps that's one reason films cost so much these days; they're all handmade.

The Mac offers benefits for preproduction, filming, and some postproduction because it can keep everything organized. For the producer or editor with modest needs, Mac-based video provides a viable alternative to expensive production facilities. However, until the Mac offers all the features of traditional editing systems like the CMX, it is unlikely many Macintoshes will star in Hollywood postproduction. ■

See *Where to Buy* for contact information.

Peter S. Marx *develops image-processing applications in Los Angeles. He doesn't actually own a television, preferring the Mac for his video entertainment.*
Franklin N. Tessler, *a radiologist and* Macworld *contributing editor, watches ultrasound images during the day and television at night.*

PUTTING THE SQUEEZE ON VIDEO

While we've discussed the Mac as an editing controller and video-output device, we've avoided the topic of using video sequences on the Mac itself. Certainly, the ability to record video sequences for use in presentations and multimedia applications could propel the Mac from the static world of PICT and TIFF files to that of motion images. It would be like going from a slide show to a motion picture.

Alas, although the Mac is powerful enough to perform almost any spreadsheet or word processing function, it is unable to record even ten seconds of NTSC video without resorting to data-reduction methods such as image compression. And when HDTV hits the United States, the required processing power is going to far exceed that available in today's Macs.

A number of companies are working on hardware- and software-based image-compression products. Based upon standards called JPEG (Joint Photographic Experts Group) and MPEG (Motion Picture Experts Group), these products can record video directly onto hard drives using a destructive, or *lossy,* form of image compression. It's called lossy because some information is discarded or "lost"; the resulting images do not exactly match the originals—in order to compress the image. (For more information on compression, see "The Big Squeeze," *Macworld,* January 1991.) However, because JPEG and MPEG are destructive, they can't be used in broadcast-quality video production.

One company that's actively working on the video-compression problem is SuperMac Technology. SuperMac has demonstrated a board and software that compress 24-bit color images, video, and audio onto storage devices—for example, a hard drive or magneto-optical drive. The company claims that with its technology, removable hard drives can store up to a half-hour of video. The same board, currently code-named Digital Film, also decompresses video in real time for playback in a window on the Mac screen. SuperMac plans to ship the board the first half of this year for under $5000.

Apple, meanwhile, has demonstrated a software-only solution to video compression at several conferences. Basically, Apple's software turns the Mac into a low-quality equivalent of a videodisc player. The software uses a proprietary compression scheme that, when combined with relatively small images, produces high frame rates on most Mac models.

At Educom, Apple demonstrated an interactive newspaper combining video from CNN Headline News with text from the Associated Press and graphics from *USA Today.* The interactive newspaper was produced using HyperCard 2.0 with proprietary video playing XCMDs written by Apple. Users accessed the previous night's news by clicking the mouse. Despite the small viewing area for the video clips (2¼ by 1½ inches), they conveyed the majority of the information found in television news. Accompanying text provided news junkies with more substantive information.

LAST NAME
TITLE
COMPANY
FILE #
T
CONTRACT
PHONE 1
PHONE 2
YB1
File #
Contract
Phone 1
B2
Phone 2
Tracking
0

YOU'VE GOT THE INFORMATION ON FILE. WITH THE RIGHT SOFTWARE, YOU CAN PUBLISH IT AUTOMATICALLY.

Publish Your Database

Catalogs, directories, course schedules, labels of all types—if you produce documents like these, you're a candidate for database publishing. Database publishing enables you to maximize efficiency by using a single database to create a variety of documents without ever having to lay the documents out manually. It works best with publications that are highly structured and repetitive and is especially useful for any document that's frequently revised.

There are two paths to the marriage of data and design. The easy way is to use a database manager's form-layout features to format the hard copy. You can't get too fancy with this approach, but you can get acceptable results quickly. The more circuitous route involves combining a data manager with a desktop publishing program. This way requires more work but delivers better-looking results. And by coordinating a programmable database's ability to create coded text files with the publishing program's style-sheet abilities, you can enjoy the best of both worlds without doubling your effort.

This article examines both techniques. Along the way, I evaluate just how well several data managers and publishing programs handle database publishing jobs. For the data managers, I use Microsoft Works, ACIUS's 4th Dimension, and Claris's FileMaker Pro. The publishing programs I consider are Aldus PageMaker 4.0, QuarkXPress 3.0, and Letraset's DesignStudio 1.01. I concentrated on these programs because they're popular, but many of the concepts discussed here apply to other programs as well.

BY JIM HEID

ONE-STOP SHOPPING

Most Mac database managers provide basic page-layout features that let you move fields around, create boxes and rules, paste a company logo or other graphic into a database form, and use various fonts and type styles. In short, they provide everything you need for simple database publishing tasks—inventory reports, mailing labels, schedules for in-house seminars, or company phone directories.

Database publishing at this level is easy because the database program doubles as a publishing program, giving you one-stop convenience and eliminating the headaches involved in moving data from one program to another. The drawback? Having to work within the layout and typographic limitations of the database manager.

To test the database publishing facilities, I produced a client directory, personalized form letters, mailing labels, and name tags for a direct mailing announcing a company open house. My database contained fields for client names and addresses and the last contact date. Similar data-management tasks might include an employee directory that would yield a personalized form letter announcing a charity drive and mentioning the employee's last contribution, or a club membership database that could provide a form letter announcing a forthcoming dues payment.

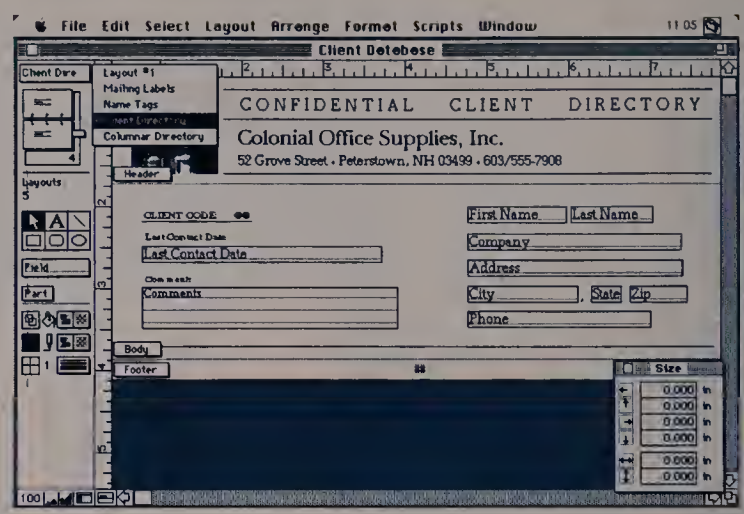
Here's how each product fared.

▪ *Microsoft Works* Works is an excellent jack-of-all-trades program, but it's no database publishing tool. Works lets you position fields where you want them, but you can't mix and match fonts or sizes in database forms or reports, and the headers and footers print in one, unalterable font and style. You can't make style changes (bold, italic, and so on) in forms, and in reports the only permissible style change is that whole columns can be in bold or italic.

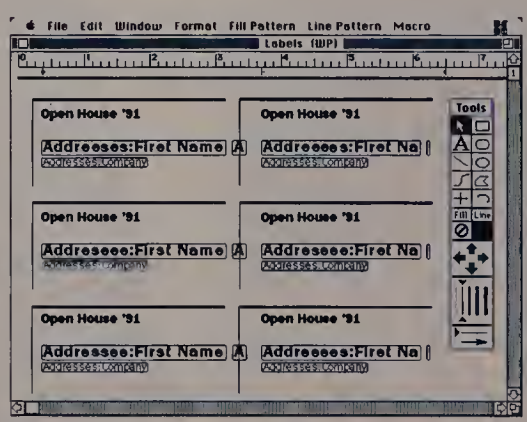
By using Works' word processing module, you can coerce the program into producing formatted labels and reports. Works' word processor provides access to the program's drawing tools and has a print-merge feature that lets you include fields from a database (see "Working around Works"). You switch between the draw layer and the word processing layer frequently, and you tweak tab settings till the cows come home, but it works. And the print-merge feature is exactly what you need for personalized form letters.

▪ *4th Dimension* This everything-but-the-kitchen-sink data manager has an excellent set of form-layout features. Tool palette icons let you align fields and other objects in relation to one other. Headers and footers can contain graphics. You can create multiple *break areas* that highlight totals or other summary information. And layouts can contain buttons that, when clicked, activate other layout windows or execute routines written in the program's script language.

4th Dimension (4D) also handles form letters beautifully, thanks to its ability to include fields in text areas. Text areas can also contain *variables,* which reflect the results of calculations. In my direct-mail form letter, for example, I included a variable called WeeksSinceLast that printed the number of weeks since the most recent client contact (4D calculated this variable by subtracting the date of the last contact from the current date).



FileMaker Pro Layouts FileMaker Pro provides powerful, MacDraw-like layout features. You create any number of layouts, and switch between them by choosing layout names from the pop-up menu shown here.



Working around Works Works has no form-layout features to speak of, but by using the program's word processor, drawing tools, and print-merge feature, you can produce formatted documents like the name tags above. Tip: When producing labels or other documents in a multicolumn format, set up and format one row of labels, and then copy and paste that row to fill the page.

4D's real strength is that you (or a database consultant) can combine these talents with the program's run-time application features to create turnkey database publishing applications that look and work like standard Mac programs. Indeed, the 1990 edition of ACIUS's *4th Dimension Solutions Directory* lists such an application. Desjardin Consulting's DB Report Writer automates the production of structured documents by providing fields for holding and entering repetitive text, and generates rich text format (RTF) files that many word processors and publishing programs can import. Another turnkey database-publishing application is Eclipse Service's Classified Ad Tracking System, which automates the process of producing newspaper classifieds. The system keeps track of advertiser information and the text of ads, sorts ads by category, produces camera-ready art, and handles billing. Classified Ad Tracking System was created with Odesta's Double Helix II, another high-end database manager with excellent form-design features. Eclipse offers another turnkey application—Events Listing System—that generates newspaper events-listing sections.

FileMaker Pro

The trouble with high-end, programmable databases is that they have high-end learning curves. Claris's FileMaker has always provided a more accessible mix of data-management and form-design features than do programs such as 4th Dimension or FoxBase +/Mac. FileMaker Pro makes

a good thing even better. Indeed, FileMaker Pro provides the best layout features of all the data managers discussed here. You can zoom in and out on a layout, align fields and objects to each other, lock objects to prevent modification, and display on-screen rulers and T squares for precise positioning (see "FileMaker Pro Layouts"). A Preview command lets you see exactly how a page will look when printed. And many of these features work like their counterparts in Claris's MacDraw II, so you'll feel at home if you're familiar with that program.

Formatting mailing labels in FileMaker Pro is easy, too, thanks to a Label Setup dialog box that lets you specify the labels' dimensions and how many to print across the page. Formatting custom form letters can be tricky, however, since you have to mix field items and distinct text items. The 4D approach—letting you include fields by putting their names within angle brackets (<>)—works better.

The Best Form

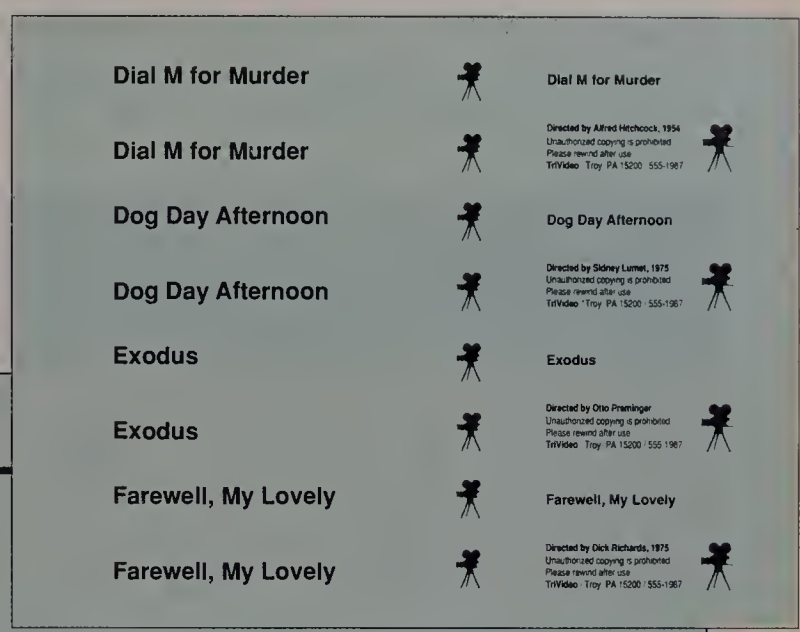
For one-step database publishing of everything but form letters, use FileMaker Pro. Its superior layout features combined with its ability to switch between layouts in a flash give you complete flexibility in presenting data. 4D has great layout features too, but they, like 4D in general, take time to master.

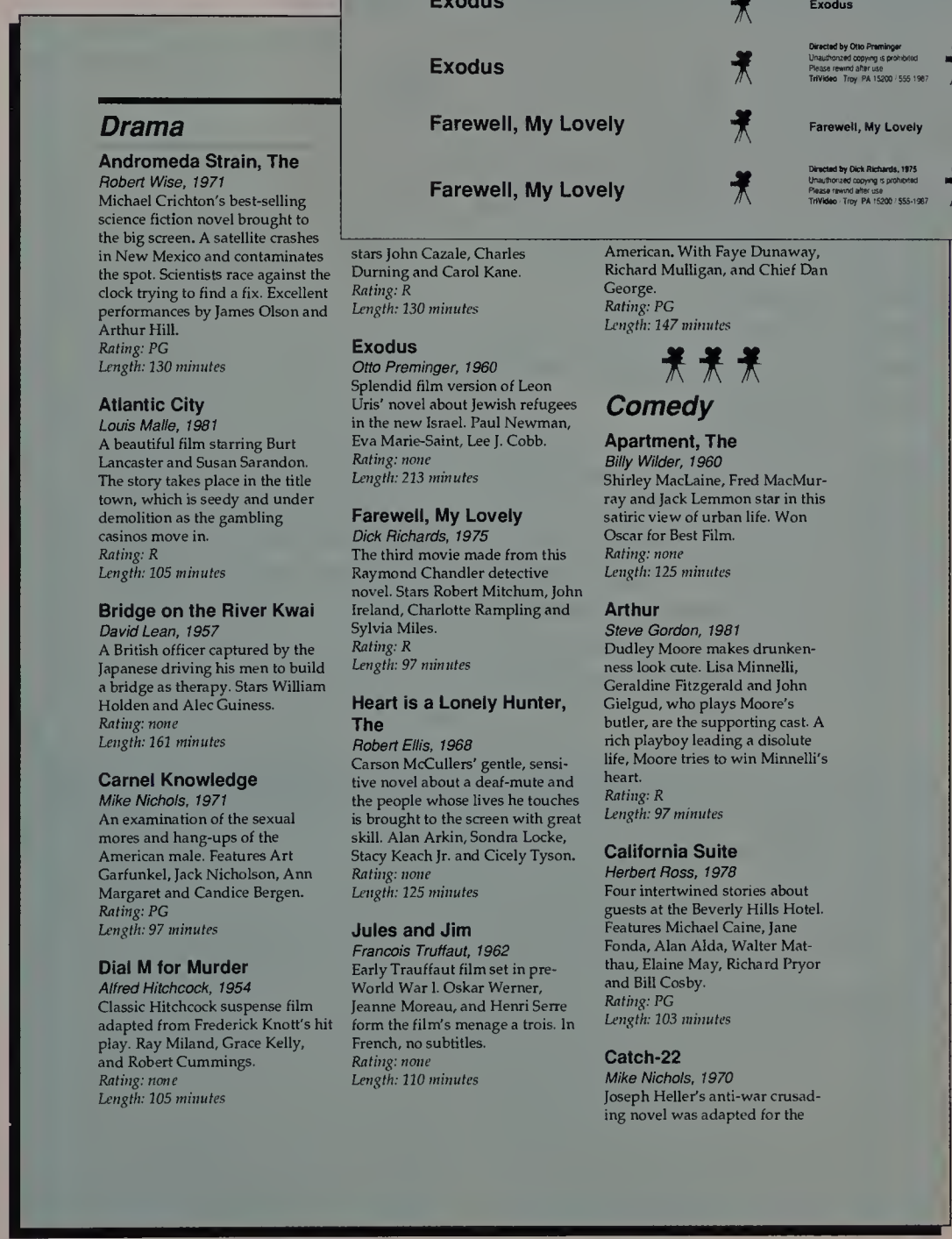
Regardless of which program you use, I recommend coming up with different forms for data entry and for creating printed materials, especially if you're using a laser printer for the latter. For on-screen viewing, the Mac's ImageWriter fonts (Geneva, New York, and so on) are generally more legible than the screen fonts that correspond to laser printer fonts such as Times and Helvetica. Also, if you position as many fields as possible to fit within one screen, you won't have to do as much scrolling during data entry and searching sessions.

The Two-Step

Where fine, professional-quality typography and layout are concerned, the publishing features in all database managers fall short. No Mac database manager provides manual- or automatic-kerning features for improving text spacing. Their features for producing shaded boxes and rules are limited compared to those of page-layout programs. While several data managers support spot color for fields and graphic elements, none can print color separations. And only a masochist would use a database manager to produce a large, graphically complex publication such as a 500-page catalog or a yellow pages phone directory. The range of features necessary for working efficiently on such a large project just aren't available in a database program.

For tasks like these—and for any job demanding top-quality typography—you need to combine a database manager with a desktop publishing





Drama

Andromeda Strain, The
Robert Wise, 1971
Michael Crichton's best-selling science fiction novel brought to the big screen. A satellite crashes in New Mexico and contaminates the spot. Scientists race against the clock trying to find a fix. Excellent performances by James Olson and Arthur Hill.
Rating: PG
Length: 130 minutes

Atlantic City
Louis Malle, 1981
A beautiful film starring Burt Lancaster and Susan Sarandon. The story takes place in the title town, which is seedy and under demolition as the gambling casinos move in.
Rating: R
Length: 105 minutes

Bridge on the River Kwai
David Lean, 1957
A British officer captured by the Japanese driving his men to build a bridge as therapy. Stars William Holden and Alec Guiness.
Rating: none
Length: 161 minutes

Carnel Knowledge
Mike Nichols, 1971
An examination of the sexual mores and hang-ups of the American male. Features Art Garfunkel, Jack Nicholson, Ann Margaret and Candice Bergen.
Rating: PG
Length: 97 minutes

Dial M for Murder
Alfred Hitchcock, 1954
Classic Hitchcock suspense film adapted from Frederick Knott's hit play. Ray Miland, Grace Kelly, and Robert Cummings.
Rating: none
Length: 105 minutes

stars John Cazale, Charles Durning and Carol Kane.
Rating: R
Length: 130 minutes

Exodus
Otto Preminger, 1960
Splendid film version of Leon Uris' novel about Jewish refugees in the new Israel. Paul Newman, Eva Marie-Saint, Lee J. Cobb.
Rating: none
Length: 213 minutes

Farewell, My Lovely
Dick Richards, 1975
The third movie made from this Raymond Chandler detective novel. Stars Robert Mitchum, John Ireland, Charlotte Rampling and Sylvia Miles.
Rating: R
Length: 97 minutes

Heart is a Lonely Hunter, The
Robert Ellis, 1968
Carson McCullers' gentle, sensitive novel about a deaf-mute and the people whose lives he touches is brought to the screen with great skill. Alan Arkin, Sondra Locke, Stacy Keach Jr. and Cicely Tyson.
Rating: none
Length: 125 minutes

Jules and Jim
Francois Truffaut, 1962
Early Trauffaut film set in pre-World War I. Oskar Werner, Jeanne Moreau, and Henri Serre form the film's menage a trois. In French, no subtitles.
Rating: none
Length: 110 minutes

American. With Faye Dunaway, Richard Mulligan, and Chief Dan George.
Rating: PG
Length: 147 minutes

Comedy

Apartment, The
Billy Wilder, 1960
Shirley MacLaine, Fred MacMurray and Jack Lemmon star in this satiric view of urban life. Won Oscar for Best Film.
Rating: none
Length: 125 minutes

Arthur
Steve Gordon, 1981
Dudley Moore makes drunkenness look cute. Lisa Minnelli, Geraldine Fitzgerald and John Gielgud, who plays Moore's butler, are the supporting cast. A rich playboy leading a disolute life, Moore tries to win Minnelli's heart.
Rating: R
Length: 97 minutes

California Suite
Herbert Ross, 1978
Four intertwined stories about guests at the Beverly Hills Hotel. Features Michael Caine, Jane Fonda, Alan Alda, Walter Matthau, Elaine May, Richard Pryor and Bill Cosby.
Rating: PG
Length: 103 minutes

Catch-22
Mike Nichols, 1970
Joseph Heller's anti-war crusading novel was adapted for the

Data on Display This sample PageMaker output from the video database illustrates how database publishing enables you to use the same data to produce a variety of documents. The VHS videocassette labels use the Title and Director/Year fields and are designed to be printed on Avery #5455 full-sheet label stock and then cut apart. The catalog page uses the Category, Title, Director/Year, Description, Rating, and Length fields. DataShaper's section divider code (%^) was used to print the Category field's contents (Drama, Comedy) only when they change rather than before every entry.

program. This wedding of data and design often takes place at the business end of a shotgun. Getting a data manager and a publishing program to communicate requires an intimate familiarity with both. You'll need to master the database manager's data-exporting features and the publishing program's importing and style-sheet-formatting features.

Fortunately, for publications requiring frequent updating—such as telephone books, catalogs, and price lists—you need to perform setup chores only once. Producing updated versions is a matter of exporting the changed data and then importing it. PageMaker users can even create links to a database to produce updated versions automatically.

For the test task, I produced a catalog, inventory reports, and tape labels from a video-rental-store tape database (see "Data on Display"). The database contains fields for a film's title, rating, length, description, and rental history. You could adapt this rather generic application to fit any product-oriented database—books with card-catalog numbers, or widgets with part numbers and shipping weights, for example.

The foundation of two-step database publishing, exporting and importing database files, can be more complex than swapping word processor files, especially when you're publishing columnar documents (such as my inventory report), where fields are aligned in their own columns and each record has its own row. The complicating factors are *delimiters;* these characters inserted by the database publishing program as it exports to text act as boundaries, separating each field and each record.

Delimiters come in two flavors: tabs and commas. In a tab-delimited text file, a tab character separates each field; commas do the job in a comma-delimited text file. Because it's likely that a field itself contains a comma — as in the film title *Hush, Hush, Sweet Charlotte*—each field value in a comma-delimited text file is usually also enclosed within quotes (see "Delimiters Demystified"). Tab-delimited text files are ideal for publishing columnar documents. After importing the text, you select it and then format it as desired. The tab codes that separate each field serve to separate the columns in the document.

DELIMITERS DEMYSTIFIED

Delimiter Type	Example
Comma	Farewell, My Lovely,R,Mitchum,color ↵
	Fatal Attraction,R,Douglas,color ↵
Commas and quotes	"Farewell, My Lovely","R","Mitchum","color" ↵
	"Fatal Attraction","R","Douglas","color" ↵
Tab	Farewell, My Lovely ▸ R ▸ Mitchum ▸ color ↵
	Fatal Attraction ▸ R ▸ Douglas ▸ color ↵

▸ *indicates tab code;* ↵ *indicates carriage return*

Delimiters Demystified

Delimiters separate the fields and records in the text files that you export using a database manager. The most common types of delimiters are tabs, commas, and commas and quotes.

The techniques for importing a text-only file depend on the publishing program. In Aldus PageMaker, use the File menu's Place command; if you have PageMaker's Smart ASCII filter installed, select the No Conversion option and then click on OK when the filter's dialog box appears. In QuarkXPress and DesignStudio, use the Get Text command after creating a blinking insertion point in a text frame.

After importing text, you can use the publishing program's search-and-replace feature to massage the data into the format required by the publication. For example, if you had to import a comma-delimited text file because that's the only format your database manager supports, you can change all the commas or comma and quote combinations to tabs. In PageMaker 4.0, type "," in the Find What text box and ^t in the Change To text box. Or, if you want each field item to appear on a separate line instead of in its own column, change each field delimiter to a carriage return. For a tab-delimited text file, type ^t in the Find What text box and ^p in the Change To box. In QuarkXPress 3.0, type \t and \p. In DesignStudio, type ∂t and ∂r (press Option-D to get the ∂ symbol).

Formatting in Style

After importing a text-only file, you need to adjust its font, tab, and line-spacing settings, among others. You can perform these chores manually by choosing formatting commands, but you save time and automate the production process by using a publishing program's style-sheet features, which let you store and recall sets of text attributes (see "Automatic Publishing"). For the video store's videocassette labels, for example, I created styles called Spine Title, Front Title, and Rating, each describing the format of those label components. After importing the database text file, I was able to quickly format the text by selecting each text item and then applying the appropriate style sheet.

You can automate this repetitive formatting even further using *tagged* text-only files, in which text is preceded by tags—style-sheet names sandwiched between angle brackets, as in <Spine Title>. When you import a tagged text file, the publishing program reads the tags, discards the tag text so it doesn't appear in the publication, and assigns styles to the accompanying text.

To add tags to a database text file, you could manually edit the file using a word processor, inserting the tags where appropriate and then saving the modified file. But that's not exactly automated publishing. A better way is to use a programmable database manager such as 4D, Double Helix, Fox Software's FoxBase+/Mac, Blythe's Omnis 5, or even HyperCard. These programs enable you to write short routines that export data and add tags (see "Following Procedures").

The DataShaper and xdata Difference

Programming a database manager is tedious at best, and torturous the rest of the time. And many data managers, including FileMaker, lack the programming language needed to create tagged text files. For PageMaker users, the solution to both problems is

DataShaper from ElseWare Corporation (formerly BenWare).

Created by the former product manager for PageMaker 4.0, DataShaper is a powerful input and output filter for PageMaker. First you use PageMaker itself to create and format *placeholders,* codes that mark the position and format of the data you'll import. Next, you select the placeholder text and export it using DataShaper's export filter; this creates a *format file.* To import the database text file, you choose PageMaker's Place command, then choose the format file. DataShaper's own dialog box then appears, where you choose the database text file. DataShaper loads PageMaker's mouse pointer with the imported text, which you can place with or without PageMaker's autoflow feature. (Autoflow is ideal for producing multiple pages having a consistent format.)

DataShaper can also rearrange the order of fields as you import them, automatically generate an index from a database, and import and place TIFF images along with database text. You can even use PageMaker's Links command to link the publication to the database text file. With the link in place, you can simply export a database each time it changes, and then start PageMaker and tell it to update the publication. DataShaper also includes a downloadable PostScript font for printing postal-service bar codes on envelopes and postcards. Throw in several sets of templates for directories, catalogs, mailing labels, form letters, and name tags, and you have what may be a database publisher's best friend.

If you use PageMaker, that is. QuarkXPress users will want to investigate Em Software's xdata, a database-publishing extension for QuarkXPress that I examined in prerelease form (it's expected to ship long before you read this). xdata is similar to DataShaper in that it requires you to first position and format placeholders—*prototypes,* in xdata parlance—that represent the fields you'll import.

But where DataShaper requires arcane, single-character codes for many formatting operations, xdata provides an English-like programming language, similar to HyperCard's HyperTalk. As a result, you have to do a bit more typing to create prototypes, but their workings are easier to understand at a glance. The language also gives xdata useful features DataShaper lacks, such as the ability to extract certain characters from a field—for printing just the last four numbers of a full telephone number, for example.

xdata 1.0 lacks some of DataShaper's talents, however. xdata can't import TIFF images, it (and QuarkXPress) lacks the ability to create a link between a publication and a database file for automatic updating, and it can't print postal service bar codes. But even without those features, xdata is an excellent database-publishing complement to QuarkXPress.

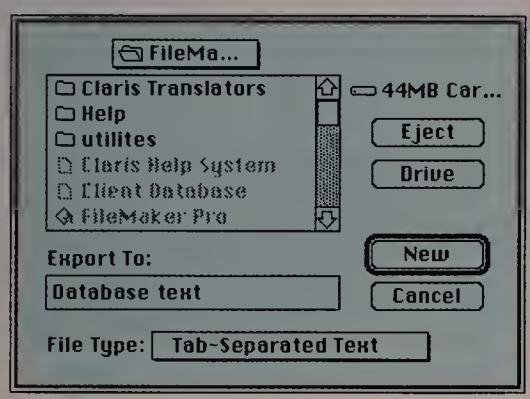
Finally, QuarkXPress users who produce classified ads should check out Baseview Products' ClassManager, an extension consisting of a multiuser database manager that tracks advertiser information and copy, and formats ad text for importing into QuarkXPress.

Who Does the Best Two-Step?

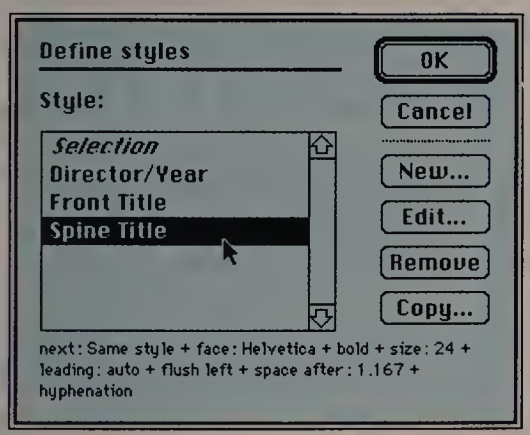
With their ability to import graphics as well as text and establish links to database files, DataShaper and PageMaker 4.0 form the most powerful database publishing duo available.

As for Letraset's DesignStudio,

1

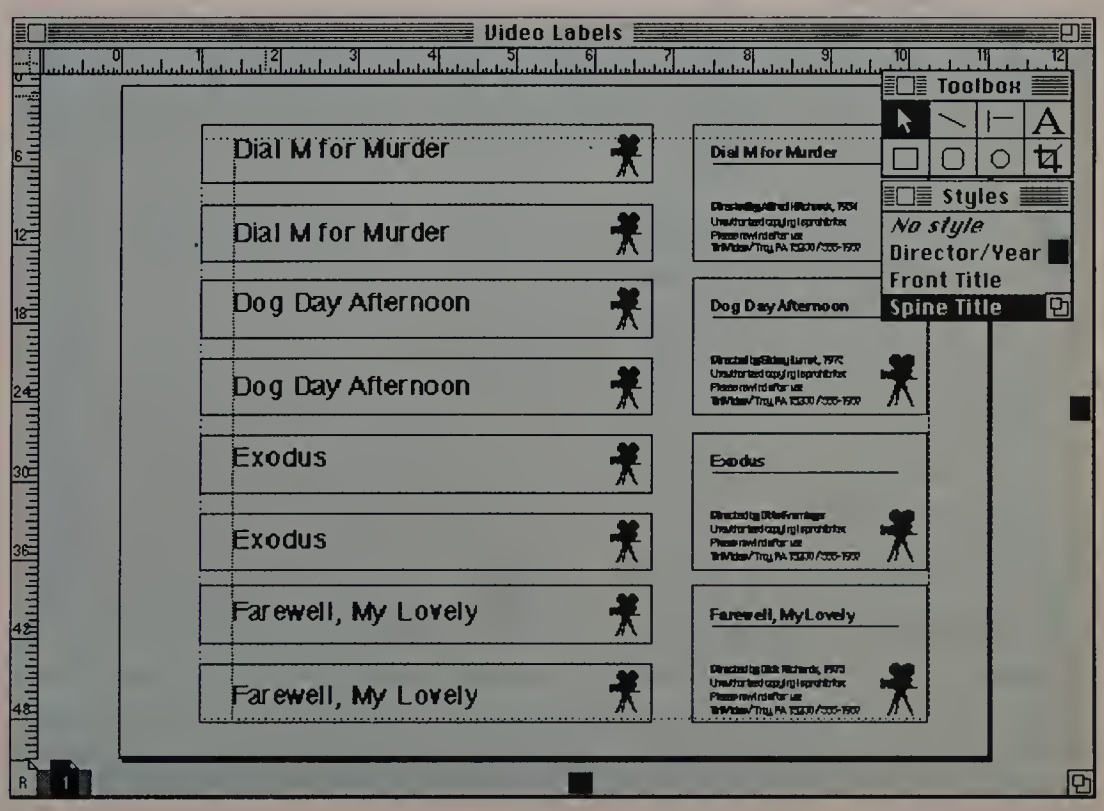


2



Automatic Publishing Combining a database manager and a publishing program generally involves these steps: (1) Exporting the desired fields and records from the database, (2) using your publishing program to define style sheets that describe the appearance of each text component in the publication, and (3) importing the database text file and applying those styles. Variations involve using tagged text files to avoid applying style sheets manually, and using a database publishing utility such as DataShaper to simplify formatting and provide additional capabilities.

3



Letraset sells DesignScript, an add-on that provides a command language for DesignStudio. (QuarkXPress 3.0 includes a similar language.) In a process similar to the one just described for adding style tags, a programmable database can be used to add command statements to exported text. DesignStudio then reads the commands and executes the format changes. Because it allows you to control virtually all of DesignStudio's layout features, DesignScript is actually more powerful than DataShaper. However, DesignScript lacks many commands vital to database publishing, such as one that automatically closes up extra space in a mailing label when a company name is absent.

The concepts I've discussed also apply to information that's exported from a spreadsheet program. All popular spreadsheet programs create tab-delimited text files; it's easy to select rows and columns and copy them to the Clipboard for subsequent pasting into a publishing program. And if you spend a great deal of time formatting spreadsheet data, you might want to investigate RagTime 3, which combines spreadsheet features with moderately powerful layout capabilities (see *Macworld, Reviews*, August 1990).

In the end, data managers such as FileMaker Pro lessen the need to use a separate publishing program to produce attractive hard copy from a database. That's good, because even with add-ons like DataShaper and DesignScript, two-step database publishing requires considerable effort and debugging. In your first attempts, fields may appear where they shouldn't, or they may not appear at all. You'll fine-tune your export commands and style sheets more often than you'd like.

But when everything works, you'll appreciate the power of database publishing, as the publishing program creates page after page of properly formatted text and graphics. Two-step database publishing is clearly overkill for producing mailing labels and in-house documents where quick turnaround is paramount. But for professional publishers, the ability to automate document production without sacrificing professional-quality typography and layout is a boon. Indeed, given the pervasiveness of catalogs, directories, business cards, and other structured publications, database publishing may be the best thing to happen to graphic arts professionals since the Mac itself. ■

See *Where to Buy* for contact information.

FOLLOWING PROCEDURES

```
DEFAULT FILE([Videos Datafile])
Doc:=Create document("")
If (OK=1)
  For ($i;1;Records in selection)
    MESSAGE("Exporting data to tagged file")
    SEND PACKET(Doc;Insert string([Videos Datafile]Title;"<Spine Title>";1))
    SEND PACKET(Doc;Char(13))
    SEND PACKET(Doc;Insert string([Videos Datafile]Title;"<Front Title>";1))
    SEND PACKET(Doc;Char(13))
    SEND PACKET(Doc;Insert string([Videos Datafile]Rating;"<Rating>Rating: ";1))
    SEND PACKET(Doc;Char(13))
    SEND PACKET(Doc;Insert string([Videos Datafile]Category;"<Category>";1))
    SEND PACKET(Doc;Char(13))
    NEXT RECORD
  End for
  CLOSE DOCUMENT(Doc)
End if
```

```
on mouseUp
  -- Get File Name
  ask "File Name to Save?"
  if it is empty then exit mouseUp
  put it into FileName
  set the cursor to 4 -- watch cursor
  -- create the file
  open file FileName
  go to second card -- ignore cover card
  -- loop for each card in the stack
  repeat for the number of cards - 1
    repeat for 10 times
      get line 1 of field "Name and Address"
      write "<name>" & it & return to file FileName
      get line 1 of field "Phone Number"
      write "<phone>" & it & return to file FileName
    end repeat
    doMenu "Next"
  end repeat
  close file FileName
end mouseUp
```

Following Procedures At top, a 4th Dimension procedure that asks for a file name and then creates a text file containing style tags and data from three fields in the videotape database. Note that the Title field is written twice: once for the Spine Title style and once for the Front Title style. At bottom, a HyperTalk script that creates a tagged text file containing the Name and Address and the Phone Number fields from HyperCard's address book stack.

Contributing editor ***Jim Held*** *has been writing about the Mac since 1983. His latest book, coauthored with Peter Norton, is* Inside the Apple Macintosh *(Brady, 1990).*

Our sales team of Mac "know it alls." Another good reason to go CDA!

Over the last ten years CDA has worked hard to create something unique in the field of computer mail order—a company that could provide customers with the support they would expect from a local computer dealer, along with the convenience and economy of direct-order, by mail, fax or phone. Thus CDA has grown with the computer industry and, in the process, has earned a rock-solid reputation for providing superior-quality service and support.

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NJ/Outside US
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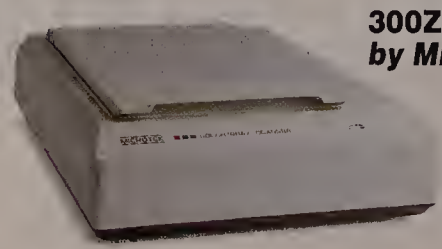

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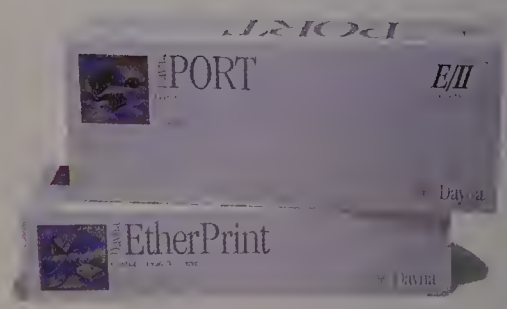
EtherNet Products from *Dayna*



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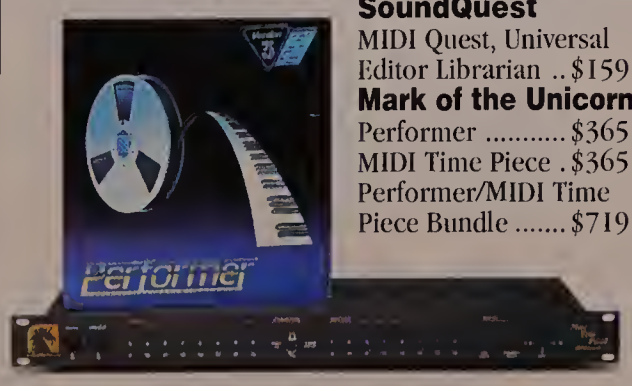

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REVIEWS

Draw Program

ADOBE ILLUSTRATOR 3.0

Pros: Improved type-handling; excellent control of type along a path; type can be converted to editable outlines; has single-page display option; has direct-selection and convert-point tools; new guide and automated graphing features. **Cons:** No online help; no grids or coordinate system; no tab-stop control; inadequate support for non-PostScript printers; saves scans in EPS format only; exported EPS images do not display in 24-bit color. **Company:** Adobe Systems. **Requires:** Mac Plus; 2MB RAM; hard drive. Recommended: Mac II. **List price:** $595.

STEVE LYONS

Adobe Illustrator was the first drawing program to take advantage of the full range of graphic possibilities offered by the PostScript page-description language. Despite a long list of firsts—including the first automated tracing tool, the first object-oriented pattern option, and the first blending feature—Illustrator's poor type-handling capabilities exiled thousands of artists to its closest competitor, Aldus FreeHand. Even loyal Illustrator users expressed disappointment that Adobe, a leader in PostScript typeface design, seemed satisfied with its program's abysmal treatment of type: a single text block was restricted to a maximum of 255 characters, all in the same style, size, and typeface; you couldn't justify or kern type; and you couldn't join type along a free-form path.

Finally Adobe has remedied all of these problems, so that Illustrator 3.0 does what its forebear Illustrator 88 should have been able to do all along. You can now create and manipulate type directly in the drawing area. You can even flow text between multiple text blocks. A direct-selection tool allows you to select points and segments within grouped objects. Users who need a precise drawing environment can position guides that attract the cursor as you draw or modify images. An automated graphing feature allows you to create bar, line, and pie charts.

Interface Lift

Though Illustrator 3.0 is similar in structure to previous versions, you'll notice a few changes. All objects are created and manipulated in the familiar square field that represents an 18-by-18-inch drawing area. But rather than being divided into a clumsy gridwork of printing tiles, the drawing area now contains the dotted outline of a single page. The area around the page acts as a nonprinting pasteboard. Alternatively you can subdivide the drawing area into multiple whole pages or partial printing tiles using options in the Preferences dialog box.

The lower left-hand corner of each Illustrator window contains an information bar showing the active tool or the current operation. This information can be helpful if you aren't quite sure how to operate a selected tool (for example, "Pen: click or drag first anchor"), but otherwise it verges on useless, failing to provide the kind of placement coordinates and transformation details included in the FreeHand information bar. Even more disappointing, this limited information bar represents the extent of Illustrator's online help.

The New Toolbox

The toolbox has been more than doubled, now including 39 tools. One notable addition is the direct-selection tool, used to select and modify one or more elements in a grouped object without affecting other items in the group or disrupting the integrity of the group. You can also select groups that are in the next level up in the grouping hierarchy by Option-clicking two or more times. Each successive Option-click selects the group that contains the current group. Consider the case of a rectangle, which is a shape that is automatically grouped with a center point. If you Option-click the

rectangle using the direct-selection tool, you select only its outline; Option-click a second time to select both outline and center point; Option-click a third time to select any additional objects that may be grouped with the rectangle.

Another new tool is the convert-point tool, which can be used to reshape an arc to form a corner or change a corner to an arc. This has long been possible in FreeHand, in which converting a point is as easy as selecting a radio button. The process is slightly more complicated in Illustrator 3.0 but more versatile as well. Dragging the convert-point tool from either a point or bezier control handle, you both convert the point and reshape its adjacent segments in a single gesture.

Rather than displaying all 39 tools at the same time, Illustrator has a hierarchical toolbox sectioned into 16 slots. To select a tool that is not currently displayed, drag from a tool icon to produce a menu of alternates for that slot.

Hiring a Guide

Many artists complain that Adobe Illustrator lacks the features needed to create schematic and architectural renderings. Illustrator 3.0 remains deficient in this regard. Unlike Aldus FreeHand, Illustrator 3.0 still lacks a coordinate system for precisely positioning points and curves. Illustrator also fails to provide grids, a feature common among even the most rudimentary drawing programs.

The only structural enhancement to Illustrator 3.0 is the introduction of guides. As in FreeHand, you can create a horizontal or vertical guideline by dragging from one of the rulers. You can even create free-form guides by selecting an object and choosing the Make Guide command. In either case, the guide neither prints nor previews; it simply attracts the cursor as you draw or modify elements. In theory, the guides enable you to create customized grids to meet specific requirements. In practice, establishing even a simple grid structure requires more time and effort than it's worth.

The Single-Page Champ?

Illustrator 3.0's motto is "Precision drawing, page layout, and production . . . the single most powerful design tool you've ever owned." This claim seems to be primarily based on the program's new type-handling and graphing capabilities. You can pour long stories into multiple columns and display data in six kinds of charts. You can even import text from a word processor—Microsoft Word, MacWrite, and WriteNow formats are supported—and import tab-delimited data from a spreadsheet.

Like any good page-layout program, Illustrator lets you drag the type tool to create a rectangular column of text. If a story exceeds the boundaries of the column, a small plus sign appears to indicate overflow type. To flow the text into another column, simply clone the outline of the column (by Option-dragging it with the direct-selection tool) or select any existing path and choose the Link command.

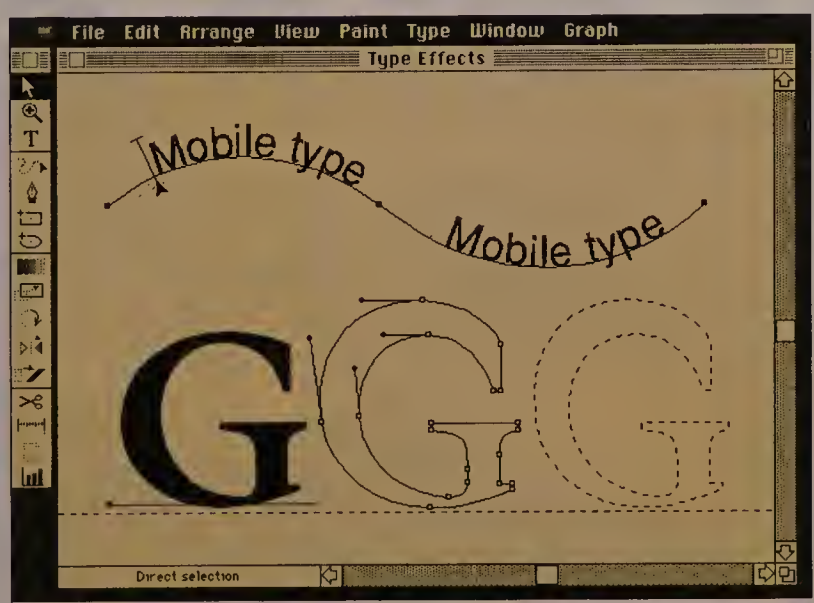
Illustrator 3.0 manages type along a path far more expertly than FreeHand does. Type is automatically kerned to account for the shape of the path, eliminating excessive gaps and overlapping characters. You can adjust the vertical placement of type along a path (called Vertical Shift) so that the text appears above the path, below the path, or somewhere in between. If you don't like the way the text sits on the path, you can drag a special handle associated with the text block to move type back and forth on the path, or flip it to the other side (see "All in Good Type").

For logo designers, Illustrator's tour de force is its Create Outline command, which converts all characters in a text block to standard paths. There are only two prerequisites: Adobe Type Manager 2.0 (included with Illustrator 3.0) must be installed, and the printer font for the current typeface (Type 1 fonts only) must be available.

Compound paths allow you to see through hollow areas in letters. To draw an *O* for example, you might draw a black-filled oval and then draw a white-filled oval in front of it. However, if this *O* appears against a colored background, the white oval will appear opaque, not as a hole. A compound path allows the white oval to represent an unfilled area in the *O*, effectively cutting a hole through the shape and revealing any background object.

To create a chart, you simply drag one of the six graphing tools—bar, stacked-bar, line, pie, area, or scatter—to determine the dimensions of the chart. A Graph Data window appears in front of the chart. Admittedly, Illustrator's worksheet is nowhere near as powerful as a worksheet in a full-fledged spreadsheet program like Microsoft Excel; it can't perform calculations and you can't insert or delete cells. Illustrator's primary strength in this area is the freedom it provides for editing a chart once it is created. Charts are organized into hierarchical groups of objects: one group contains a single bar, the next group up contains an entire series of bars, and so on. This hierarchical organization makes the process of reshaping and transforming graph elements as easy as, well, pie.

(continues)



All in Good Type
You can create type inside a path or along the outline of a path. If you choose the latter, you can drag the I-beam handle to position type (top). The Create Outlines command converts type to editable outlines, which may be modified like standard paths or even used as guides (bottom).

Does all this add up to the best program for creating single-page documents? Almost, but not quite. For one, Illustrator 3.0 does not include a spelling checker or a hyphenation dictionary. You can insert discretionary hyphens (⌘-Shift-hyphen) on a word-by-word basis, but you can't control the overall hyphenation scheme of a story or paragraph. More bewildering, Illustrator does not provide any means for determining tab stops. In fact, the tab character isn't even properly supported. Pressing the Tab key moves the insertion marker to the beginning of the next line of type. This makes creating numbered or bulleted lists awkward, if not nearly impossible.

Selective Support

Illustrator's biggest problem has always been its lack of support for the non-PostScript crowd. Like its ancestors, Illustrator 3.0 does not print high-resolution images to non-PostScript printers, including ImageWriters and LaserWriter SCs. Also, Illustrator 3.0 can only import images saved in encapsulated PostScript (EPS) format; MacPaint, PICT, and TIFF files are not supported, except as nonprinting tracing templates.

And if you're looking for high-end color export, look again. The PICT component of an EPS image exported from Illustrator 3.0 doesn't appear on 24-bit monitors that are set to display millions of colors although the file will print correctly. Adobe claims that this problem will be addressed in a future maintenance release. FreeHand suffers from none of these inadequacies.

Adobe's narrow worldview is irritating, but not crippling. If you own a PostScript output device and don't require a draw package with image-editing capabilities, you'll find that Illustrator's functions far outweigh its faults. Here is an amazing application, even by Macintosh standards, packed with powerful capabilities that make it—without a doubt—the best design package currently available. If you're an illustrator or graphic designer, Adobe Illustrator 3.0 is one program you'll have to see to believe.

—Deke McClelland

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Modular Keyboard

SWITCHBOARD

Pros: Unprecedented configuration flexibility; superior key layout; compatible with both Mac and IBM; street price less than Apple extended keyboard. **Cons:** Disappointing trackball module; no function-key templates. **Requires:** Mac 512K. **Company:** Datadesk International. **List price:** $239.95 (includes alpha, cursor, and numeric keypads); vertical function key module $49.95; trackball module $149.95; two-row F-key module $99.95.

The amount of time we spend selecting a keyboard is wildly out of proportion with the amount of time we spend using it. The vast majority of Mac users buy an Apple keyboard and leave it at that, probably unaware that better and less expensive keyboards are available elsewhere.

The new Switchboard from Datadesk is a perfect example. Not only is this keyboard built like a rock, but it represents a significant reexamination of this crucial computer-interface element. Its designers clearly studied today's keyboard, realized that the status quo isn't necessarily the best possible arrangement, and sought a better approach.

I'll Be Switched

The Switchboard's most highly publicized innovation is that each bank of keys—the numeric keypad, the alphabet keys, the function keys, and so on—is contained in its own removable module. By rearranging these modules, you can essentially redesign the keyboard. Left-handed users can install the numeric keypad on the left. Macro nuts can install an additional, vertical bank of function keys. Dvorak typists can replace the normal key configuration with their preferred arrangement. Many of the most exciting possibilities are still under development: an accountant's numeric keypad with subtotal key; yet another bank of function keys—two rows of them—to go above the standard bank; and a digitizing tablet, with stylus.

Any three of these modules snap into a basic shell. (With a not-yet-available extender, you'll be able to attach a fourth module to one side of the main keyboard.) Popping out the modules takes some practice; you have to push from beneath the keyboard with your thumbs, simultaneously prying the top part with your fingers. Otherwise, switching modules is simple. You press the end of a ribbon-style connector into the keyboard shell and then slip the module into its new location.

The ads for the Switchboard make it appear that you can use whichever keyboard pieces you need in whatever arrangement you want. In practice, this isn't quite the case. For one thing, all pieces must snap into the basic, fixed-size, extended-keyboard shell; when traveling, for example, you can't slip the alphabet keyboard module by itself into your carrying case. (Datadesk says, however, that an optional nonextended shell is in the works.) Furthermore, the keyboard comes with three modules—alphabet, cursor

(continues)

MARK JOHANN

Switchboard from Datadesk International

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KODAK XL7700 Digital Continuous Tone Printer.

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Circle 377 on reader service card

keys (with Home, End, and so on), and numeric keypad. Thus, there are initially only six possible configurations, since you must use all three modules and only those three. Additional modules, of course, are sold separately.

Key Components

Even so, the Switchboard offers a welcome set of improvements and thoughtful touches. The Option, ⌘, and Control keys are intelligently laid out on *both* sides of the space bar; it's indeed a pleasure to have an Option key within one-hand's striking distance of, say, the P key. Owners of Datadesk's previous keyboard, the Mac-101, will be grateful to note that the numeric keypad is back to the configuration nature intended it to have, with an equal sign on the top row. Finally, Datadesk has painted the symbols on the keypad and cursor keys (such as +, =, and the arrows) at a slightly-larger-than-standard size. That extra point or two makes life easier when, for example, you're glancing back and forth from the numbers you're entering to an open spreadsheet in Excel.

As though these improvements to the standard keyboard weren't enough, Datadesk even lets you reconfigure the keyboard's brains. Flip one of the easy-to-access DIP switches, and you'll never again type U>S>A: the keyboard makes Shift-period (and Shift-comma) transmit a regular period or comma to the Mac, like the typewriters of old. Another example: the Switchboard's Caps Lock key is above the Shift key. But if you prefer to have Caps Lock in the lower-left corner, as on the Apple keyboards, flip another DIP switch and the Switchboard mentally reverses the Control and Caps Lock key positions. The appropriately shaped physical replacement keys are included in the Switchboard package.

The arrangement and labeling of the Switchboard's keys are so intuitive and thoughtful, in fact, that you may be startled to see keys that have been labeled with IBM PC users in mind. There they are: SysRq, Break, Scroll Lock, and others, looking as comfortable on a Mac keyboard as a snowman in Miami. The Return key is labeled Enter (that's right: two Enter keys). And Datadesk has changed the Delete key's name back to Backspace. Of course, one remarkable feature of the Switchboard is that it can indeed be used with either a Mac or an IBM computer with nothing more than a DIP-switch flip. But dyed-in-the-wool Mac users will wish Datadesk had also included replacement keys for the ones bearing alien-looking legends.

The Magic Touch

There's one more aspect of keyboard design that Datadesk has attacked with a vengeance: the touch. There have always been two typist camps: tactile-types, who like each key to produce a little audible/tangible click when it's pressed; and feather-touches, whose main objective is to type as much with as little effort as possible and who prefer clickless keyboards. The company must have become weary of the endless debate between the two: now you can choose. The normal Switchboard has the clickiest feel of any keyboard: if you press very lightly and slowly, you can actually feel the tension point you push past when you're typing. Working on it is a satisfying, if noisy, experience. (Datadesk says that according to their research, almost everyone prefers such a clicky touch.) But if you (or your easily-distracted co-workers) prefer to use a quieter, less clicky, infinitesimally less labor-intensive keyboard, Datadesk's soft-switch model is also available.

The only touch you might dislike is on the optional trackball module. Below the ball is the "mouse button"—a thumb bar that's a delight to use. But on both sides of the trackball are click-lock areas; when clicked, they make the Mac think the mouse button is being pressed continuously, until you click one of these areas a second time. The trackball isn't available at this writing, but the prototype trackball's click-lock areas take lots of time to get used to and require an uncomfortable amount of force to click. And there are cursor keys just above the trackball; that's convenient. But they're in a peculiar, L-shaped arrangement; that's not.

Switch Boards?

Except for the IBM key labeling, the oddities of the trackball, and the fact that Datadesk doesn't include label templates for function keys, there's virtually no downside to the Switchboard. At the very least, for a street price lower than that of Apple's extended (and clickless) keyboard, you get a superior input device. Like Datadesk's other keyboards, this one is as rugged as they come. And, with its sharp-looking acrylic-covered LED indicators, it's even a little stylish.

But with its improvements in key layout, its configurability, and its potential for future expansion, the Switchboard is more than a worthy contender. It represents a careful and successful rethinking of the Macintosh component we should think more about.—**David Pogue**

See* Where to Buy *or circle 768 on reader service card.

PostScript Page Printers

BUSINESS LASERPRINTER IIS

Pros: Moderately fast controller teamed with 8-ppm engine provides good all-around performance; SCSI connector accepts hard drive for font storage; 200-sheet paper tray is included; sleep mode reduces power requirements; excellent documentation. **Cons:** Setup is slightly harder than with QMS-PS 410; additional accessories required for use with IBM PCs; HP and Diablo emulation modes cost extra. **Company:** GCC Technologies. **List price:** $2899.

QMS-PS 410

Pros: Fast controller processes complex documents quickly; emulation sensor adapts to incoming data, eliminating mode switches; good documentation; excellent print quality; contains 45 fonts. **Cons:** 4-ppm engine is a bottleneck for some jobs; paper tray holds only 50 sheets. **Company:** QMS. **List price:** $2795; optional 250-sheet tray $195.

Now showing in the you-say-"tomayto"-I-say-"tomahto" department: the QMS-PS 410 and GCC's BLP IIS, two PostScript-based laser printers priced at under $3000. What a study in contrasts these two printers are: The QMS-PS 410 caters to both the Mac and IBM PC

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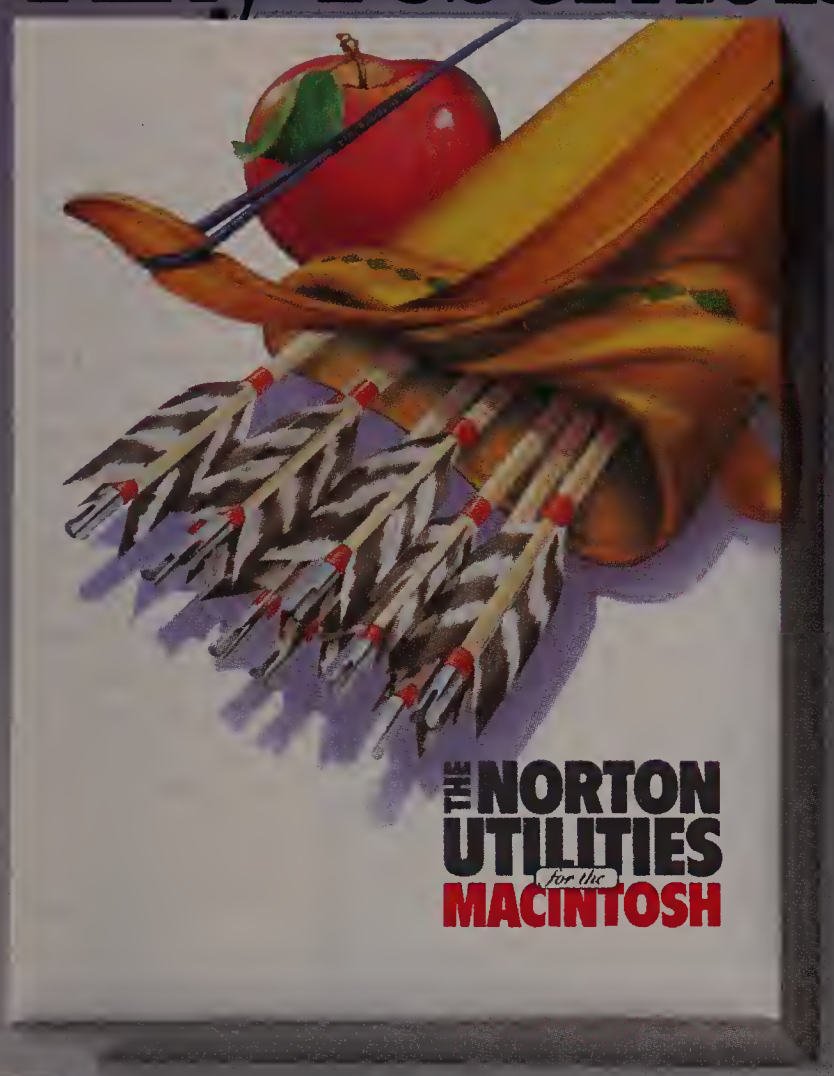
Any resemblance to other Macintosh utilities is pure coincidence.



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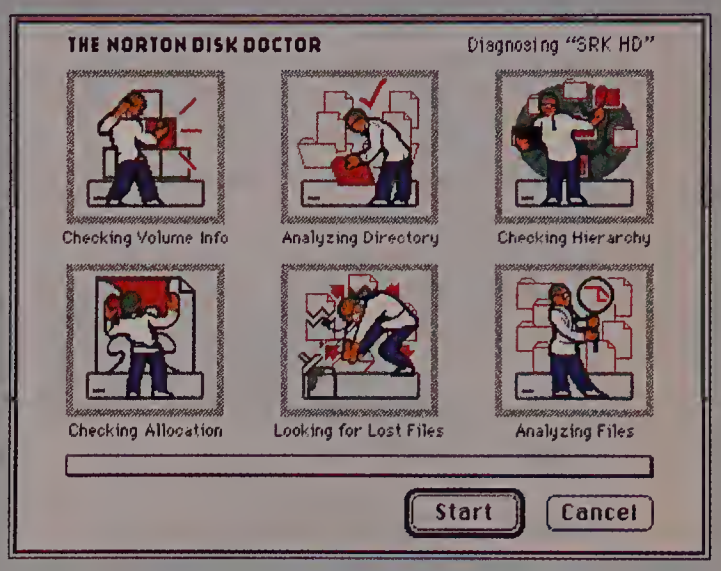

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Circle 141 on reader service card

worlds; the BLP IIS is made for Macs. The QMS-PS 410 uses a laser-based engine, while the BLP IIS uses light-emitting diodes (LEDs) to expose its images.

But most significant, the QMS-PS 410 combines a swift controller with a slow engine, while the BLP IIS pairs a slower controller with a fast engine. As a result, which printer is faster depends on what you print. That's true with most page printers, but these two prove the point especially well.

Start Your Engines

The QMS-PS 410 uses Canon's 4-pages-per-minute LBP-LX engine (formerly called the P-110), the same mechanism used in Apple's new Personal LaserWriters and Hewlett-Packard's LaserJet IIP (see "Page Printers Revisited," *Macworld,* October 1990). As with other Canon engines, setup is simple: pop out two plastic shipping spacers, slide in the disposable drum and toner cassette (good for 3500 pages), and you're done.

The BLP IIS uses an 8-ppm Oki Electric OL-800 engine, a faster and heavier-duty version of the OL-400 that's used in GCC's popular Personal LaserPrinter as well as in the BLP IIS's slower sibling, the BLP II. Setup is slightly more complex than for the QMS, with three components to install instead of just one, but the process is straightforward and clearly illustrated in the BLP IIS's thorough manual. The toner cartridge lasts for roughly 2500 pages.

Each engine uses a different type of light source to expose images. The QMS-PS 410's LX engine uses a laser, while the BLP IIS uses an array of LEDs that flash on and off. The latter approach involves fewer moving parts, and that, in theory, could mean longer engine life. Output quality from both engines is excellent, although I had to boost the BLP IIS's print darkness setting in order to get blacks as rich as the QMS-PS 410's.

As for paper handling, it's no contest. The BLP IIS's cassette holds 200 sheets, while the QMS-PS 410's multipurpose tray holds a mere 50. QMS sells a 250-sheet cassette (which Apple includes with its Personal LaserWriters) for $195. It's worth it to avoid annoying out-of-paper error messages.

Contrasting Controllers

The controllers in the QMS-PS 410 and BLP IIS are as different as the engines they're attached to. The QMS-PS 410 uses a 68020 processor running at 16.67MHz—the same chip and clock rate used by much costlier printers, including Apple's LaserWriter IINTX. The BLP IIS uses the slower 68000 microprocessor, although it runs at the same 16.67MHz clock rate. Both printers come with 2MB of memory. The QMS-PS 410 can be expanded to 6MB; the BLP IIS, to 4MB. Both printers provide the standard 35 fonts found in nearly all PostScript printers, but the QMS-PS 410 throws in another 10—the Garamond and Helvetica Condensed families, with five styles of each.

In performance testing, the QMS-PS 410's 68020 was faster in tests that depend on processing speed. The BLP IIS's second-place times, however, were still better than those of the Texas Instruments microLaser and the Apple Personal LaserWriter NT, two other hot contenders in its class. And in tests that depend largely on engine speed, the BLP IIS's 8-ppm engine helped it finish first, ahead of even the $3995 NEC SilentWriter2 290.

But speed isn't all that differentiates these printers' controllers. The BLP IIS provides a SCSI connector that can accommodate a hard disk for downloadable font storage; the QMS-PS 410 doesn't. By eliminating font downloading time, a BLP IIS would be faster than the QMS-PS 410 when printing documents containing several downloadable fonts.

If you plan to use a printer with IBM PCs as well as Macs, the QMS-PS 410 is the better choice. It includes a Hewlett-Packard PCL Level IV emulation mode, and rear-panel Centronics parallel and RS-232C serial ports. A plug-in board containing an HP graphics language emulation mode is also available for $295.

The BLP IIS provides no emulation modes, although HP Series II and Diablo 630 emulations are available for $149. And in order to equip it with the serial port needed for reliable PostScript communication with PCs, you'll have to buy GCC's $149 PC Accessories Kit, which includes a serial interface and PC printer utilities.

Even if you add the aforementioned options to a BLP IIS, the QMS-PS 410 is still the better printer for mixed environments, thanks to its ability to automatically configure itself to match the type of data it's receiving. For example, if you send a document formatted for an HP LaserJet from a PC via the parallel port, the QMS-PS 410 automatically switches to the HP emulation mode. If, a minute later, you send a Mac document via LocalTalk, the printer switches to PostScript and LocalTalk modes. This emulation sensing is a real innovation that eliminates flicking configuration switches and wondering which port is currently active.

The BLP IIS offers no such nicety, although its front-panel LCD screen and keypad make it easier to configure than most printers, including Apple's. Besides allowing you to configure ports and emulation modes, the keypad and display let you disable the printer's start-up page and adjust various settings. To perform such tasks with the QMS-PS 410, you need to

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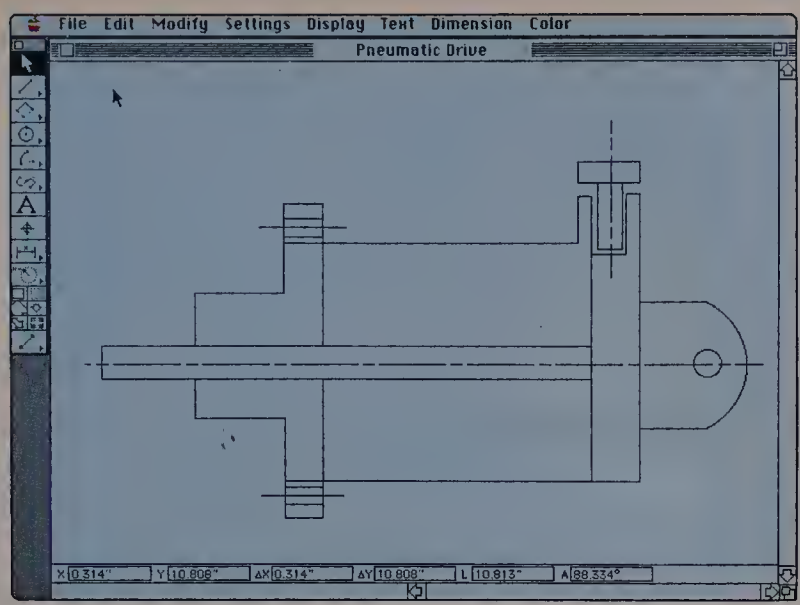
MARK JOHANN

The Business LaserPrinter IIS from GCC Technologies (on the right) and the QMS-PS 410 from QMS.



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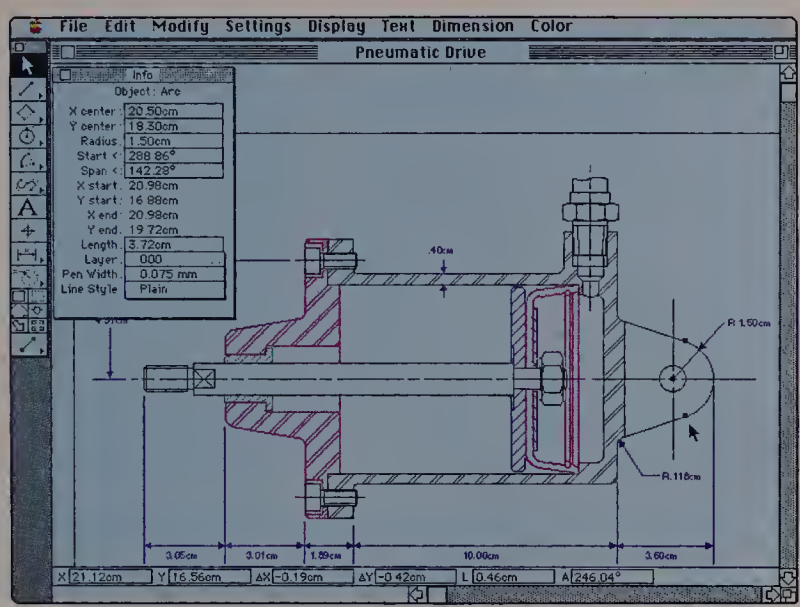

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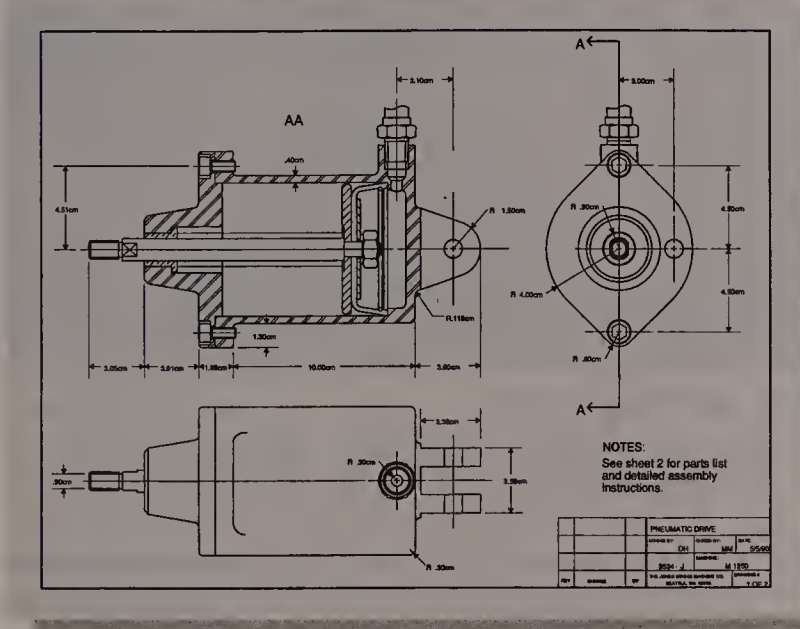

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Circle 157 on reader service card

download PostScript programs to the printer—a more laborious approach.

Brains versus Brawn

The QMS-PS 410's emulation-sensing feature makes it the best choice for offices that mix Macs and PCs. Its fast controller makes it well suited to printing complex documents and illustrations, but its 4-ppm engine and skimpy 50-sheet paper capacity make it the wrong printer for large networks and for printing long documents or multiple copies of the same one.

The BLP IIS isn't as receptive to PCs, although it doesn't snub them to the extent that Apple's printers do. Its controller is no slouch, and its SCSI port can boost performance with downloadable fonts if you add a hard drive. But what sets the BLP IIS apart is its 8-ppm engine—the fastest engine available on any under-$3000 page printer.

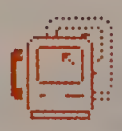
In the end, these two printers illustrate how important it is to choose a printer based on the types of documents you print. Both are excellent values—well designed and packed with features that cost thousands more not long ago. One may be a tomayto while the other's a tomahto, but neither is a lemon.—**Jim Heid**

See Where to Buy or circle 622 (BLP IIS), 735 (QMS-PS 410) on reader service card.

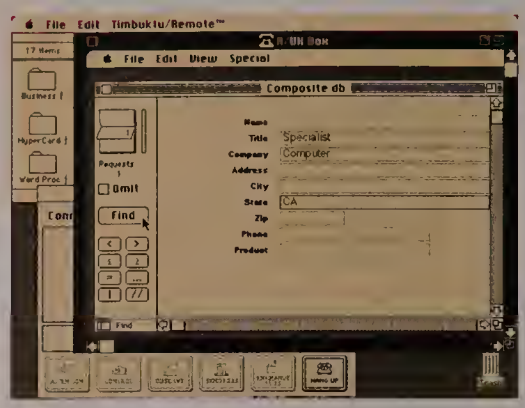
Modem and Remote Access Software

TIMBUKTU/REMOTE ACCESS PACK

Pros: Modem supports V.42bis data compression at speeds of up to 9600 bps; can start up Mac remotely by modem; can display remote Mac's screen in movable, resizable window.
Cons: Displays screens in black and white only; screen updates can be slow for 13-inch or larger monitors.
Company: Farallon Computing.
Requires: Mac Plus. **List price:** $1295.



You're on the road and you realize that you left an important file on the Mac back in your office. How can you get it? Well, thanks to Farallon's Timbuktu/Remote Access Pack, you can use another Mac to call the office, start up the Mac there, retrieve a copy of the file, and then shut down the office Mac.



A Mac in the Window Through a special window, Timbuktu/Remote lets you see what's happening on a remote Mac you've connected to. The heavy black border distinguishes this window from regular windows. In this case, the other user has opened a database file and is performing a search. The lower left-hand corner of the screen indicates the actions supported by Timbuktu/Remote. The phone icon in the upper-right corner of the menu bar indicates that the two Macs are connected.

The Modem

The Access Pack includes a 9600-bps V.32 modem that supports the V.42bis data-compression algorithm, Timbuktu/Remote 2.0, a Remote/WakeUp Cable, and Auto Shutdown software. Formerly, use of the MNP Class 5 compression algorithm offered a compression factor of 2 to 1. With V.42bis, compression factors can be up to 4 to 1. The compression varies with the type of file; spreadsheets and text files can be compressed more than sound or application files.

This Is Your Wake-up Call

A unique feature of the Access Pack is the ability to start up the Mac via the modem. Farallon accomplishes this with its Remote/WakeUp Cable—a standard modem cable with an extra cable for attaching to an ADB port on the Mac—and Timbuktu/Remote.

After attaching the Remote/WakeUp Cable to the Mac, you have to set Timbuktu/Remote to the Patient setting, that is, one that waits a specified time for any INITs to load after the Remote/WakeUp Cable starts up the Mac. Farallon recommends waiting about two minutes, but I've found that you have to use an even longer waiting period if you have a lot of INITs (my Mac takes about three minutes to load all of its INITs).

The final step is to install the Auto ShutDown cdev. It allows you to specify how long the Mac stays on after a connection is made.

To use the wake-up feature from a remote Mac, you use Timbuktu/Remote to call the remote Mac's modem. When the modem answers, the remote Mac starts, loads its INITs, and then switches to Timbuktu/Remote. Now the two Macs can talk to each other—you can start an application or transfer files using Timbuktu/Remote. You might have to be fast, though, because the Auto ShutDown software starts its timer as soon as all start-up activity is finished. I set the timer to more than 5 or 10 minutes, knowing that the Mac will shut down even after I disconnect the modem on my end.

Timbuktu/Remote

Timbuktu/Remote 2.0 includes some significant changes that make the software easier to use. One feature I've wanted is the ability to put the remote Mac's display into a movable, resizable window. Version 2.0 now does that, and puts a special black border around the window so you can easily distinguish it from other windows. Unfortunately, the latest version of Timbuktu/Remote still does not display colors; it converts everything to black and white in the Timbuktu window.

Despite the monochrome display, Timbuktu/Remote can still be pretty slow in updating screens and cursor movements. I found that 9600-bps communications between two Mac IIs with 13-inch monitors was bearable, but only barely so. My partner on the other Mac complained that the jerkiness of the cursor movement was particularly disturbing.

Should you purchase the Timbuktu/Remote Access Pack? If you're shopping for a high-speed modem, and you need to communicate between a Mac on the road and one in your home office, then the Access Pack is a good idea. Remember, though, that you're going to have to buy two Access Packs to link the two Macs. If your main concern is the modem, you can get other good-performance high-speed modems at lower prices (see "High-Speed Modems," *Macworld*, November 1990).—**Dave Kosiur**

See Where to Buy or circle 771 on reader service card.

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Michael Shapiro

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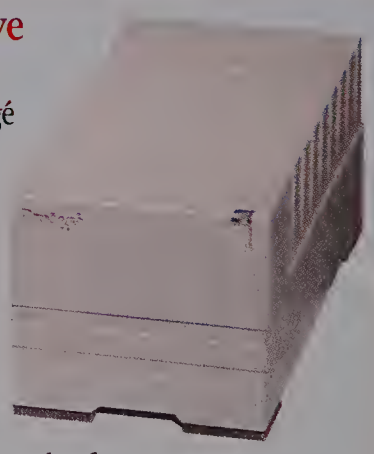

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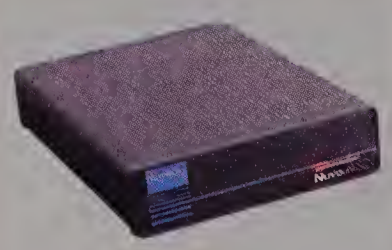


Hot New SCSI/Ethernet Interface

Connect your Mac to Ethernet with the NuvoLink SC from Nuvotech. This SCSI to Ethernet interface installs quickly and operates transparently at 10 Megabaud. Makes file transfers and E-mail fly. NuvoLink SC works with the new Mac Classic and is 10BASE T compatible with the addition of a third-party transceiver.

NuvoLink SC (Nuvotech). 22535 ..... $319

Iomega
24384 Bernoulli 40-40 ..... $2195
23834 Mac 18 Interface Kit $48
24385 Portable 44MB $1429
24393 TransPortable 44MB $999
Kennect Technology
24740 360K 5.25" Drive $299
24730 Drive 2.4 (3.5") $325
Pace
26908 Protegé HD Carrying Case $24
Quantum
24390 40MB External Protegé $455
24191 40MB Internal - (IIcx,ci) $375
24188 40MB Internal - (SE-IIx) $375
24391 80MB External Protegé $645
24192 80MB Internal - (IIcx,ci) $595
24189 80MB Internal - (SE-IIx) $595
24392 105MB External Protegé $695
24193 105MB Internal - (IIcx,ci) $645
24190 105MB Internal - (SE-IIx) $645
Seagate
24380 20MB External Protegé $345
24184 20MB Internal - (IIcx,ci) $295
24180 20MB Internal - (SE-IIx) $295
24381 40MB External Protegé $395
24185 40MB Internal - (IIcx,ci) $325
24181 40MB Internal - (SE-IIx) $325
24382 80MB External Protegé $525
24186 80MB Internal - (IIcx,ci) $465
24182 80MB Internal - (SE-IIx) $465

PRINTERS, SCANNERS AND FAXES

Adobe
38432 Postscript for LJ-II $299
Complete PC
22752 Complete Halfpage Scanner $313
22753 Complete Page Scanner $758
Dest
22762 Personal Scan $699
22764 Personal Scan w/ Recognize! $1595
Digital Vision
22758 Computer Eyes B/W $196
22759 Computer Eyes Color $344
Dove
22701 DoveFax-External $289
Epson
56339 Epson LQ-2550 - 24 pin printer $910
56340 Epson LQ-510 - 24 pin printer $289
56303 Epson LX 810 - 9 pin printer $185
Kodak
22855 M150 Mac Portable $519
38733 M150 Mac Portable Carrying Case $24.95
38341 M150 Mac Portable Ink Cartridge $12.95
Logitech
22751 ScanMan 32 ..... $319
MicroTek-IMSI
22755 Microtek 300Z Color Scanner $1945
22756 Microtek MS-II B&W Scanner $1080
Orange Micro
22854 Grappler 9 Pin $79
22853 Grappler LX $129
Orchid
22702 OrchidFAX Modem $449
Relisys
22700 Tefax RA2110 ..... $895
Seiko
22852 Label Printer $195
26902 Labels for Seiko Label Printer $11.99
Texas Instruments
22856 17 font microLaser w/ ATalk board $1795
22851 35 font microLaser w/ ATalk board $1995
25489 1MB microLaser Memory Upgrade $215
23058 2nd Drawer Feeder w/ Ltr Tray (grey) $325
23056 Envelope Feeder (grey) $299
23057 Legal Paper Tray (grey) $59
38311 microLaser Toner Cartidge $46
Thunderware
22761 Lightning Scan 400 ..... $385
22757 Thunderscan Plus $199
22760 Thunderscan Power Acc. /II $44

COMMUNICATIONS-MODEM

Applied Engineering
22306 DataLink Express $169
22307 DataLink/Mac $205
22313 DataLink/Mac w/ MNP-5/Send Fax $275
Global Village
22311 Teleport Modem $134
Hayes
49578 Smartmodem 9600 ..... $899
MacAvenue
49525 1200 External w/o SW $69
49557 2400 External w/o SW $109

CD-ROM Bonanza

The NEC CD-ROM drive gives you multi-platform and multi-format compatibility at a price that will make you look twice. This small footprint unit is complete with a compact disk offering **Type Gallery™ PS** — up to 470 Adobe PostScript™ language typefaces.

The NEC CD-ROM drive with **Type Gallery PS**. 24632 ..... $625

COMMUNICATIONS-NETWORK

Asanté
22538 MacCon+ IIE thk/thn $395
22529 MacCon+ IIET thk/UTP $395
22526 MacCon+ SE30E thk/thn $395
22531 MacCon+ SE30ET thk/UTP $395
22525 MacCon+ SEE thk/thn $295
22532 MacCon+ SEET thk/UTP $295
Dayna
22541 EtherPrint $360
Dove
22502 Fastnet III Ethernet Card $374
Farallon Computing
22511 PhoneNET® Connector DB-9 ..... $31
22513 PhoneNET Connector Din-8 ..... $31
22534 PhoneNET Din-8 to RJ11, 10pk $215
22517 PhoneNET Repeater $313

Ethernet Connector For LocalTalk Printers

Dayna **EtherPrint** takes the place of expensive routers or bridges to connect your LocalTalk printer to the Ethernet network. **EtherPrint** makes a simple "plug-and-print" connection with adaptors for any cable/printer combination.

EtherPrint (Dayna). 22541 ..... $360

22512 PhoneNET StarConnector® $18
22515 PhoneNET StarConnector 10pk $138
22516 PhoneNET StarController® $888
22518 PhoneNET StarController (harmonica kit) $64
22514 PhoneNET to LocalTalk adapter cable $9
22519 Portable Pack $329
Interex
22520 Localtalk connector DB-9 to Din 3 ..... $32
22521 Localtalk connector Din-8 to Din 3 ..... $32
22522 Phone Connector DB-9 ..... $23
22523 Phone Connector Din-8 w/ cable $25
Nuvotech
22536 Nuvolink II $279
22535 Nuvolink SC $319
Shiva
22508 Ethergate $1625
22510 FastPath 4 Gateway $1935
22505 NetBridge $339
22528 NetModem V.32 9600 baud $1425
22507 NetModem V2400 ..... $435
22504 NetSerial X232 ..... $275
22506 TeleBridge $339
Technology Works
22539 Mac II Ethernet Kit $275
22540 Mac II/10t Ethernet Kit $275
22527 Nodem (thin) $395
Tops
22503 Flashbox $117
22537 Flashcard $153

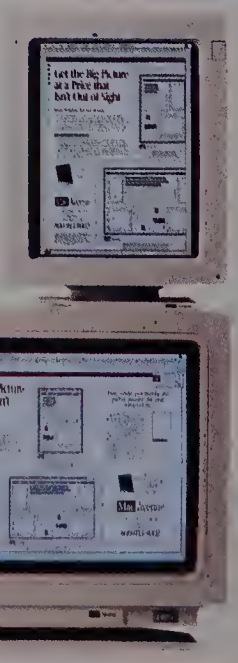
MONITORS AND VIDEO CARDS

See our ad featuring the new MacAvenue Protegé full-page and dual-page monitors.

MacAvenue
22011 Protegé Dual Page with card $895
22010 Protegé Full Page with card $495
Micron
23544 Mac II 8-Bit 1024X768 ..... $585
23543 Mac II 8-Bit 640X480 ..... $345
23542 SE/30 8-Bit 1024X768 ..... $585
23541 SE/30 8-Bit 640X480 ..... $345

More Monitor for the Money

MacAvenue's Protegé full-page and dual-page screens are comparable to Apple or Radius monitors that cost more than twice the MacAvenue price. You'll appreciate the great resolution, flicker-free refresh rates and other convenient features like tilt/swivel bases.

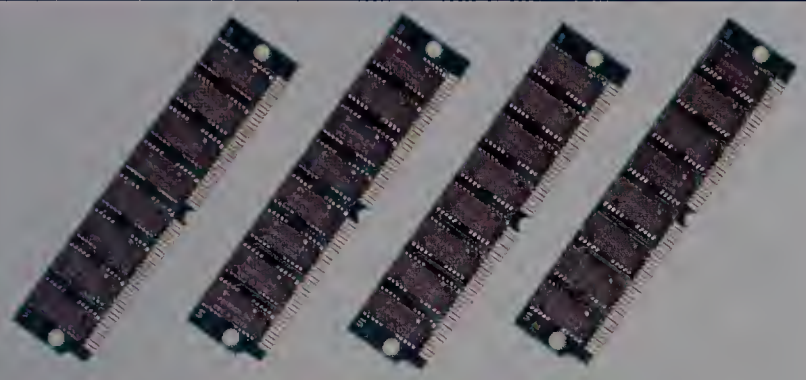


MacAvenue Protegé monitors:
Full-page 22010 ..... $495
Dual-page 22011 ..... $895

MacAvenue

800-926-6221

Customer Service Is Our Most Important Product



NEW LOW PRICE! $54/Megabyte

Get the most processing power out of your Mac: build your four-slot SE to 4MB or your 8-slot Mac to 8MB. Only the best surface-mounted 80 nanosecond memory products. Call MacsFax for pricing chart.

2 x 1MB SIMM Kit —80ns (Technology Works). 25480 ..... $108
4 x 1MB SIMM Kit —80ns (Technology Works). 25482 ..... $216

RasterOps
22006 19" Monitor w/ Color Board 708 ..... $4550
23538 ColorBoard 208 ..... $375
23531 Color8oard 264 ..... $575
23539 ColorBoard 264/SE30 ..... $685
23540 ColorBoard 364 ..... $974
22007 Grey Scale 19" Monitor GS30 ..... $1614
Seiko
22002 14" Color RG8 ..... $595
22009 20" CM-2050 Color Monitor $2395
Seiko/RasterOps
22005 14" w/ Color8oard 208 ..... $909
22001 14" w/ ColorBoard 264 ..... $1119
Sigma Designs
22000 Colormax 19" monitor w/ card $4645
22008 L-View Multi-Mode 19" w/ card $1495
22100 PageView 15" w/ Mac II adapter $1050
22101 PageView 15" w/ SE adapter $999
22106 PageView 15" w/ SE/30 adapter $1050
22104 SilverView 21" w/ Mac II adapter $1599
22107 SilverView 21" w/ SE adapter $1599
22103 SilverView 21" w/ SE/30 adapter $1599

ACCELERATOR/EXPANSION BOARDS

DayStar
23632 030 25MHz II w/ co 68882 ..... $1149
23640 030 25MHz IIcx w/ co 68882 ..... $1499
23644 030 25MHz IIx w/ co 68882 ..... $1149
23633 030 33MHz II w/ co 68882 ..... $1539
23641 030 33MHz IIcx w/ co 68882 ..... $1899
23645 030 33MHz IIx w/ co 68882 ..... $1539
23638 030 40MHz II w/ co 68882 ..... $1699
23642 030 40MHz IIcx w/ co 68882 ..... $1999
23646 030 40MHz IIx w/ co 68882 ..... $1699
23639 030 50MHz II w/ co 68882 ..... $2309
23643 030 50MHz IIcx w/ co 68882 ..... $2599
23647 030 50MHz IIx w/ co 68882 ..... $2309
Dove
23636 Marathon 030 SE/30 board $499
Technology Works
23648 IIci Cache Card $269

Create Your Own Programs

When you're ready to start building your own software applications, use Symantec's **THINK C** or **THINK Pascal**, the programming packages that make it easy for you. Both are powerful and flexible enough to fit any programming need.

THINK C v4.0 (Symantec). 27586 ..... $163
THINK Pascal v3.0. 27584 ..... $160

MEMORY EXPANSION

Applied Engineering
25488 1MB Upgrade for Mac Portable Exp. Card ... $359
25487 MacRam Portable Card w/ 1MB $499
Bay Electronics
25489 TI Laser Memory Upgrade $215
Catt
26906 SIMMs Installation VHS Video $9
Interex
26881 Tool kit (3 pieces) $15
Technology Works
25480 2 X 1MB SIMM Kit 80ns $108
25484 4 X 1M8 SIMM FX Kit $232
25482 4 X 1MB SIMM Kit 80ns $216
25483 4 X 1MB SIMM NTX Kit $232
25490 4 X 4MB II/IIx Kit $1195
25491 4 X 4MB FX Kit $1195
25481 4 X 4MB SIMM Kit 80ns $1120
25485 Mac Portable 1M8 Upgrade Kit $389
25486 Mac Portable 3M8 Upgrade Kit $1195

Choose the Best Monochrome

The Sigma **L-View** will zoom out to display your work as small as 70% or zoom in to show an image as large as 200%. Use the **L-View** hot-key commands to choose one of six built-in resolution options. This low-emissions monitor also offers a fast 92Hz refresh rate that gives a flicker-free screen image.

L-View Multi-Mode (Sigma)
19" monitor w/card. 22008 ..... $1495

KEYBOARDS, MICE, ETC.

Advanced Gravis
25286 ADB Mousestick $66
Basic Needs
25282 Cordless Mouse $89
DataDesk
25184 15 Function Key Module $42
25185 Mac 101 Keyboard Platinum (Plus) $134
25180 Mac-101 Keyboard, ADB $134
25181 Mac-101 Keyboard Beige (Plus) $134
25183 SWITCHBALL $98
25182 SWITCHBOARD $159
Kensington
25281 Turbo Mouse ADB $107
25280 Turbo Mouse Plus $107
MicroSpeed
25285 MacTrac (SE, II, IIgs) $75
Mouse Systems
25283 Little Mouse $75
25284 Trackball ADB $69

Seiko
23734 DT3600 Digitizing Tablet $295

ACCESSORIES

American Power
26292 UPS 110SE $207
26294 UPS 370ci $337
Applied Engineering
26917 QuadraLink $205
Bernouilli
57804 Bernouilli B33C 44MB $95
Calcomp
26918 WIZ $157
Cover-Up
25780 Mac Plus K8 Skin (81 Key) $14.95
25781 Mac Plus KB Skin (w/ # Pad) $14.95
25782 Mac SE/II 101 KB Skin $14.95
26909 Diskette Wallet 10pk (alligator) $7.50
26910 Diskette Wallet 10pk (blue) $7.50
26911 Diskette Wallet 3pk (alligator) $5.50
26912 Diskette Wallet 3pk (blue) $5.50
26895 Imagewriter II Dust Cover $8
26894 Mac Plus/SE Dust Cover $8
Fellowes
52655 Compact Personal Shredder PS 50 ..... $119
Inland
40504 1 Mode Surge Protector $9.95
40505 3 Mode Surge Protector $14.50
Innovative Technology
26903 The Library (grey) $12
26905 The Library (black) $12
26882 SE Anti-Glare Filter (beige) $32
26883 SE Anti-Glare Filter (platinum) $32
26884 Security Kit $33
26888 System Saver Plus (beige) $62
26907 System Saver Plus (platinum) $62
26889 System Saver SE $62
25582 Tilt/Swivel $24
26896 Universal Printer Stand $15

Best Sports Game ... 1990

Strap on your boards and hang on! 20+ challenging courses, a course editor, weather conditions, obstacles, digitized sound, color graphics and more. **MacSki** is your lift ticket to FUN!

MacSki (X/OR). 28756 ..... $38

The New Value in Word Processing

A new program, **TASTE** from DeltaPoint combines the most popular features from word processing and page layout packages to give you document design capability, drawing, address book, mail merge, color and full word processing all-in-one program at a great price.

TASTE (DeltaPoint).
30638 ..... $98

Interex
26890 A/B Box Din 8 ..... $33
26281 Mac 128/512 to Hayes D89 to 25pin, 6ft $7
26282 Mac 128/512 to Imagewrtr DB9 to 25pin $7
26280 Mac to SCSI 25m to 50m 2ft $11
26290 Mac to SCSI System Cable, 6ft $15
26904 MacAvenue Mouse Pad $4
26283 MacPlus Peripheral Adapter cable, 1ft $7
26284 MacPlus, SE, II to Apple Modem $7
26285 MacPlus, SE, II to Hayes Din 8 to 25pin $7
26286 MacPlus,SE,II to Imagewrtr DIN 8 to 25 ..... $7
26287 MacPlus,SE,II to Imagewrtr II DIN 8/DIN 8 ..... $7
26297 Mini DIN8 to Mini Din8 ..... $7.95
26289 SCSI Peripheral Cable, 2ft $13
26295 SCSI Terminator, 50pin M/F Daisy-Chain $18
26296 SCSI Terminator, 50pin male $18
Irwin Magnetics
23832 External Tape Back-Up 5040/60 ..... $635
23833 External Tape Back-Up 5080/120 ..... $795
Kensington
26891 Apple RG8 Anti-Glare Filter $62
26900 Keyboard Replacement Cable, 3ft $24
26897 LaserWriter II Dust Cover $12
26899 Mac II Monitor Extended Kit $32
25580 Mac II Monitor Stand $62
26892 Mac II Stand and Cable Kit $63
26887 Mac II System Stand $20
26893 Masterpiece Mac II $103
MacAvenue
57200 5.25" Diskettes 1.2MB (10pk) $10.99
57000 5.25" Diskettes 360KB (10pk) $4.99
41035 Datavac Bags (5pk) $2.95
41753 Keyboard drawer $19
41019 Kleen Keyboard Kit $8.98
41601 Teak 3.5" Double Rolltop Box (90) $29
41600 Teak 3.5" Single Diskette Box (45) $17.99
41752 Teak Keyboard Drawer $69
41026 Vaccuum w/ hose and acc $45
Pace
26898 MacAvenue Carrying Case $65
26901 MacAvenue Carrying Case Extended Kybd ... $76
Sony
57440 3.5" Diskettes 1.44MB (10pk) $24.95
57401 Sony 3.5" Diskettes 800KB 10Pk $13.95
Summagraphics
26885 Bit Pad Plus $318
Tripplite
40510 SpikeBar SK6-6 ..... $22

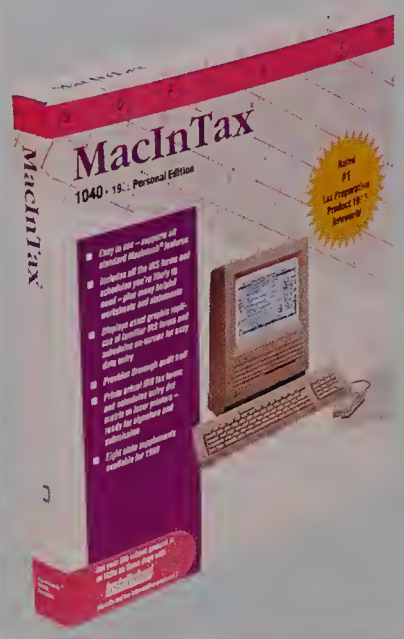
SOUND INTERFACES

Farallon Computing
26886 Hyperdialer $32
23730 MacRecorder* $158
Passport Designs
23732 MIDI Interface $76

MacAvenue

800-926-6221

Protegé Meets the Toughest Demands



Tax Help From MacInTax

Four-time *World Class* and *Eddy* award winner! **MacInTax** is the best-selling tax product for the Macintosh. Loaded with new features for 1990! And **MacInTax** is the only tax product available that prints exact replicas of IRS forms and schedules on blank paper. Full integration with 13 optional state supplements.

MacInTax (SoftView).
28502 ..... $61

Make Third-Party Printer Connections

If you're looking for a way to connect a third-party, 24-pin printer to your Macintosh, the **Orange Micro Grappler LX** is the solution. Connects to Epson, Hewlett-Packard, Toshiba and other Epson 24-pin or HP LaserJet-compatible printers.

Grappler LX (Orange Micro). 22853 ..... $129

Software

Writing and Publishing

WORD PROCESSING/WRITING

Ashton-Tate
30600 FullWrite Professional v1.5 ..... $253
Microsoft
30582 Microsoft Word v4 ..... $245
30584 Microsoft Write v1 ..... $77
Nolo Press
29888 WillMaker v4.0 ..... $34
WordPerfect
30591 WordPerfect Mac 2.0 ..... $234

PAGE LAYOUT PUBLISHING

Aldus
29781 PageMaker v4.0 ..... $497
Claris
29200 SmartForm Designer $291

UTILITIES FOR WRITERS/PUBLISHERS

DeltaPoint
30638 Taste $98
Lexpertise
30630 MacProof 3.2.1 ..... $115
Lifetree
30632 Correct Grammar $49
Reference Software
30634 Grammatik Mac $50

FONTS AND FONT UTILITIES

Adobe
29834 Adobe Plus Pack v1.0 ..... $119
29268 Streamline v1.2 ..... $225
29830 Type Reunion v1.0 ..... $38
29826 TypeAlign v1.0.4 ..... $58
29825 TypeManager 2.0 ..... $57
Broderbund Software
30450 Typestyler $115

Business Software

INTEGRATED/BUNDLED APPLICATIONS

Microsoft
30182 Microsoft Office Bundle $525
30580 Microsoft Works v2 ..... $177

ACCOUNTING/BOOKKEEPING

ChipSoft
28500 Turbo Tax $51
DAC
28475 Easy Light Checkbook Acctounting v2.0 ... $41
Intuit
28458 Quicken v1.5 ..... $39
Meca
28463 Managing your Money $139
Monogram
28465 Dollars & Sense v5.0 ..... $86
ProPlus
28494 Wall Sreet Investor $395
Reality Software
28496 WealthBuilder $145
Softsync
28481 Accountant Inc. Professional $345
SoftView
28498 if x: Personal Tax Analyst $47
28502 MacInTax 1040 Federal 1990 ..... $61

DATA ANALYSIS AND PRESENTATION

Odesta
27818 Data Desk 3.0 ..... $458

"Cream of the 2-D Crop" - *Infoworld*

Generic CADD from Generic Software gives you powerful computer-aided design features and sophisticated tools — all the tricks of the trade — at a price that's only a shadow of other CAD package prices.

Generic CADD. 29280 ..... $372

DATABASE

Acius
27780 4th Dimension v2.1 ..... $511
27820 File Force $247
Claris
27789 FileMaker Pro $216
Fox Software
27790 FoxBase II v2.0 ..... $292
Lotus
29904 Marketplace $525
Microsoft
27798 Microsoft File v2.0A $123
MySoftware
27816 MyAdvanced MailList $27
Power Up
30442 Address Book Plus v2.0 ..... $59
Preferred Pub's
27834 Database $67
Sensible Software
27830 Bookends 1.2 ..... $50
Ventura
29906 Ventura Publisher $582

TIME AND PROJECT SCHEDULING

Claris
29740 MacProject II 1.1 ..... $366

OFFICE PRODUCTIVITY PROGRAMS

Microsoft
30496 Microsoft Mail 2.0 ..... $85
Power Up
30440 Letter Writer Plus $54

Manage Your INITs

Baseline's INIT Manager not only controls your INIT start-up sequence but also helps resolve any INIT conflicts. And APB Express offers you simple yet comprehensive backup options with the touch of a button.

INIT Manager (Baseline). 30542 ..... $35
APB Express (Baseline). 30544 ..... $55

SPREADSHEET PROGRAMS/TEMPLATES

Ashton-Tate
30187 Full Impact v2.0 ..... $245
Informix
30184 Wingz v1.1 ..... $245
Microsoft
30180 Microsoft Excel v2.2 ..... $245

Communications

ON THE MODEM

Farallon Computing
27669 Timbuktu/Remote™ 2.0 ..... $123
Hayes
27662 SmartCom II v3.1 ..... $84
Microcom
27708 Carbon Copy Mac $119
Microsoft
27680 MS Mail 20 Pack v2.0 ..... $959
27678 MS Mail Server $246
27676 MS Mail Workstation $83
Prodigy Services
27726 Prodigy Startup Kit $27
Solutions Inc.
27712 Faxgate Plus $237
SW Ventures
27660 Microphone II v3.0 ..... $213
Tops
27686 NetPrint v. 2.0 ..... $115
27685 Tops Network Bundle/DOS $159
27683 Tops Network Bundle/Mac $188
Traveling SW
27710 LapLink Connectivity $119

ON THE NETWORK

Dataviz
27718 MacLink Plus $118
Farallon Computing
27744 Liason v3.0 ..... $259
27666 Timbuktu™ 3.0 ..... $95
Insignia Solutions
27714 Soft PC 1.3 ..... $245
27716 Soft PC AT/EGA $125

HP Printing Utility

MacPrint lets you print from any Mac application to the Hewlett-Packard LaserJet and DeskJet series printers as well as the Epson EPL 6000. Convenient Chooser-level driver selection provides straight forward Mac printing.

MacPrint v1.2 (Insight). 30428 ..... $94

Education and Entertainment

ON THE LEARNING CURVE

A Lasting Impression
28016 ResumExpert $38
Broderbund Software
27964 Calculus v1.2 ..... $57
27962 Geometry v1.2 ..... $57
27966 Physics v1.2 ..... $57
27958 Type! v1.0 ..... $18
Carina Software
28004 Voyager v1.2 ..... $87
Davidson & Ass.
28042 AlgeBlaster Plus $29
27970 Math Blaster Mystery $27
27968 Math Blaster! v1.0 ..... $29
Goldstein & Blair
28026 Mac Bible, 3rd edition $22
28028 Mac Bible (Super) $28
Great Wave
27990 KidsMath v1.1 ..... $25
Individual SW
28030 Training for PageMaker $38
MECC
28032 Exploring Microsoft Works $17
28034 Number Munchers $29
28036 Word Munchers $29
Sensible Software
28010 Sensible Grammar $50
Simon & Schuster
28008 Typing Tutor $28
Visionary Software
28040 Synchronicity $39

JUST FOR THE FUN OF IT

Accolade
28690 Mean 18 ..... $25
Activision
28700 Cosmic Osmo $40
28696 Manhole $28
28698 Manhole (CD ROM) $34
Addison-Wesley
28750 Stupid Mac Tricks $16

Mac Avenue

800-926-6221

The Competitive Edge: Federal Express For $2

JUST FOR THE FUN OF IT (continued)

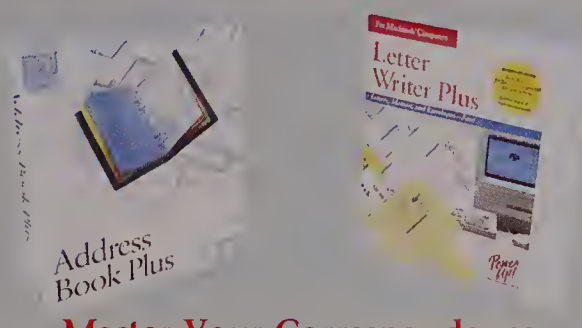
Broderbund Software
28680 SimCity Supreme (Mac II) $47
28678 SimCity v1.2 ..... $28
28672 Where/Carmen Sandiego $28
28674 Where/Europe Carmen $28
28676 Where/USA Carmen $28
Casady and Greene
28752 Mission Starlight $29
28754 Sky Shadow $29
Centron
28758 Casino Master $38
28760 Casino Master Deluxe $43
Electronic Arts
28654 Bard's Tale $30
28656 Chuck Yeager Flight Simulator $30
In-Line Design
28738 8omber $30
PCAI
28708 MacGolf $33
Sierra-On Line
28724 Kings Quest 1 ..... $28
28726 Kings Quest 2 ..... $28
28728 Kings Quest 3 ..... $28
Software Toolworks
28658 Life & Death $31
Spectrum Holobyte
28766 Faces $22
28614 Falcon v2.2 ..... $30
28606 Tetris $20
28604 Welltris $19
Strategic Studies
28652 Reach for the Stars $25

3-D Graphics Made Simple

Use Paracomp's **SwivelArt** to create 3-D graphics for models and product prototypes. Easy to learn and includes more than 100 ready-made three-dimensional models.

Swivel Art (Paracomp). 29308 ..... $82

SW Toolworks
28748 Chessmaster 2100 ..... $31
XOR
28628 MacGolf Classic $51
28756 MacSki v1.0 ..... $38
28630 NFL Challenge v1.2 ..... $54



Master Your Correspondence

Address Book Plus 2.0 offers the most complete way to manage and print your names and numbers. **Letter Writer Plus** is a handy Desk Accessory that puts powerful letter-writing and mail-merge tools at your immediate disposal. The two programs work together for the the fastest and easiest mail merge.

Address Book Plus (Power Up) 2.0 30442 ..... $59
Letter Writer Plus (Power Up). 30440 ..... $54
Address Book Plus/Letter Writer Plus bundle. 29404 ..... $85

The Graphic Arts

MOSTLY DRAWING

Adobe
29789 Illustrator v3.0 ..... $348
29266 Photoshop v1.0.7 ..... $498
Aldus
29784 Freehand v2.02 ..... $326
Claris
29207 CAD 2.0 ..... $639
Generic Software
29280 Generic CADD $372

MOSTLY PAINTING

Baseline
29310 Color MacCHEESE v1.05 ..... $55
Claris
29202 Claris MacPaint 2.0 ..... $94
Innovative Data Design
29241 MacDraft 2.0 ..... $192
Silicon Beach
29224 Digital Darkroom V1.1 ..... $247

MOSTLY GRAPHICS EDITING

Paracomp
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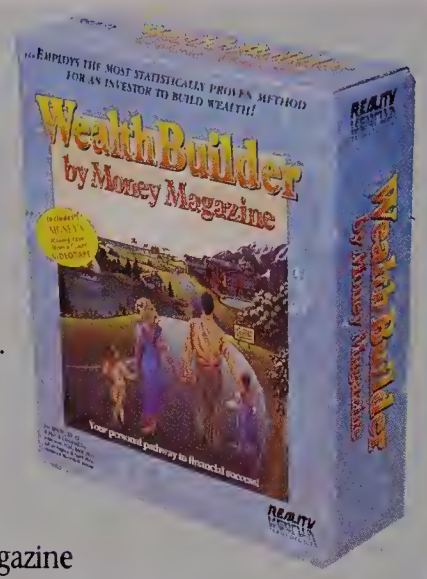

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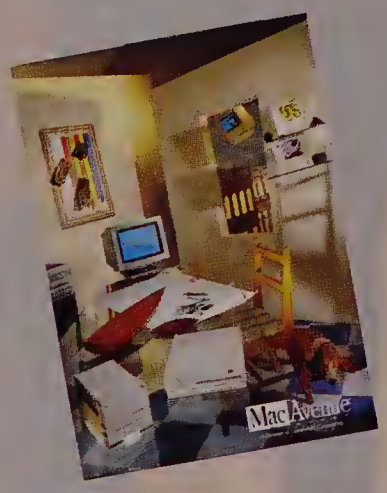

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Antivirus Utilities

RIVAL 1.1.4

Pros: Extensible for new viruses; transparent in use; both detects and removes viruses. **Cons:** Can't be customized for new virus without vaccine from company. **Company:** Microseeds Publishing. **Requires:** Mac Plus; System 6.0. **List price:** $99.

SAM (SYMANTEC ANTIVIRUS FOR MACINTOSH) 2.0

Pros: Very complete virus checking; extensible for new viruses. **Cons:** SAM Intercept doesn't destroy viruses; advanced options not for the squeamish. **Company:** Symantec Corporation. **Requires:** Mac 512KE; System 6.0. **List price:** $99.95.

Ugly as the fact may be, computer viruses are something we have to live with. Although the great majority of viruses are more annoying than deadly, protecting your floppy disks and hard drives is important, especially if you frequently exchange floppies with other Macintosh users. SAM (Symantec AntiVirus for Macintosh) was one of the first commercial products to fight viruses, and Rival is one of the new contenders. Both products do the job, but they take different paths.

SAM

SAM 2.0 is a big improvement on an already good product. The program has two parts. The SAM Intercept INIT goes in the System Folder and loads each time you start the Mac. SAM monitors activity and alerts you when it sees a possible virus attack or other suspicious activity. The SAM Virus Clinic is an application that scans disks for infections, and repairs infected disks.

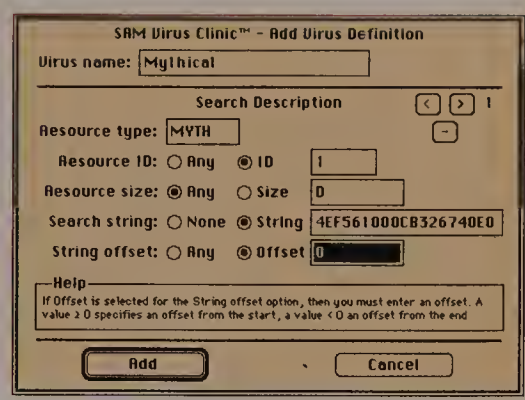
You configure SAM Intercept's many options using the Control Panel. The most important of these options is the ability to set one of four levels of protection. The Basic level prevents infection by known viruses and their variants. The Standard level alerts you to changes, such as when an INIT is added or removed or when code resources are added or changed. The Advanced level adds a few more categories of changes, and the alerts provide more technical information. The Custom protection level includes all of the Advanced level protection, but it lets you turn off certain categories of suspicious actions.

The higher the protection level, the more likely it is that SAM will flag normal activities, as well as various suspicious activities. For example, at the Advanced level, installing a font or DA with Font/DA Mover causes SAM to alert you to a change. You can have SAM learn that a particular program you use is allowed to perform a specific action, but sometimes it's best to pay the price of protection: annoyance. Still, it's a good idea to turn off SAM temporarily when you install or remove programs. You can set SAM Intercept to scan all floppies for infection automatically or only when you hold down a key. You can even scan all or part of a hard drive whenever you start up or shut down.

You use SAM Virus Clinic to actually eradicate a virus once it's found. Virus Clinic scans floppy disks and hard drives and repairs them, removing any virus it finds and adding a checksum to each file it inoculates. Whenever that file is subsequently opened, the checksum is compared, and you're alerted if the file has changed.

The biggest change in SAM 2.0 is that it now keeps up with new viruses almost as quickly as they appear. With SAM Virus Clinic, you can add definitions for new viruses, updating your protection whenever a new virus rears its head (see "Vaccination Time"). Symantec makes new virus definitions available on its forum on CompuServe, on its own BBS, and via a 24-hour Virus Hotline, which is a toll call. Update disks with vaccine for new viruses cost $15.

SAM has several features that make it useful for network administrators, or anyone who is responsible for many Macs. You can set up SAM Intercept to require that users enter a password to change any of SAM's options. You can insert into the Intercept alerts a line of text that tells network users to call a certain extension (or to send you an E-mail message) when viruses are detected. And you can disable features that could let users circumvent their virus protection.



Vaccination Time It's easy to add a new virus definition to SAM, but you need to be careful that you type in the long search string correctly. Here I've created a new definition for the Mythical virus.

Hunting Viruses Rival's Volumes mode lets you check part or all of a hard drive for alien invaders. When it finds them, it switches to the Report mode, giving you detailed info on the intruder.

Rival

Where SAM tries be the no-holds-barred virus fighter, Rival takes a more relaxed approach. It protects against viruses but doesn't alert you to other suspicious activities. Installing Rival is simplicity itself; you just copy it to the System Folder and restart.

Rival checks each file for infection as it is opened. Rival also looks for active viruses at start-up and alerts you to any attempt to format a hard drive (except for the act of erasing a drive from the Finder). When Rival detects a virus, an alert pops up with two buttons: Stun and Repair. Stun disables the virus but doesn't remove it; Stun lets you open and use infected files on locked or read-only media, such as a CD ROM, but prevents the virus from spreading. Repair removes the virus from the disk or hard drive. Unlike

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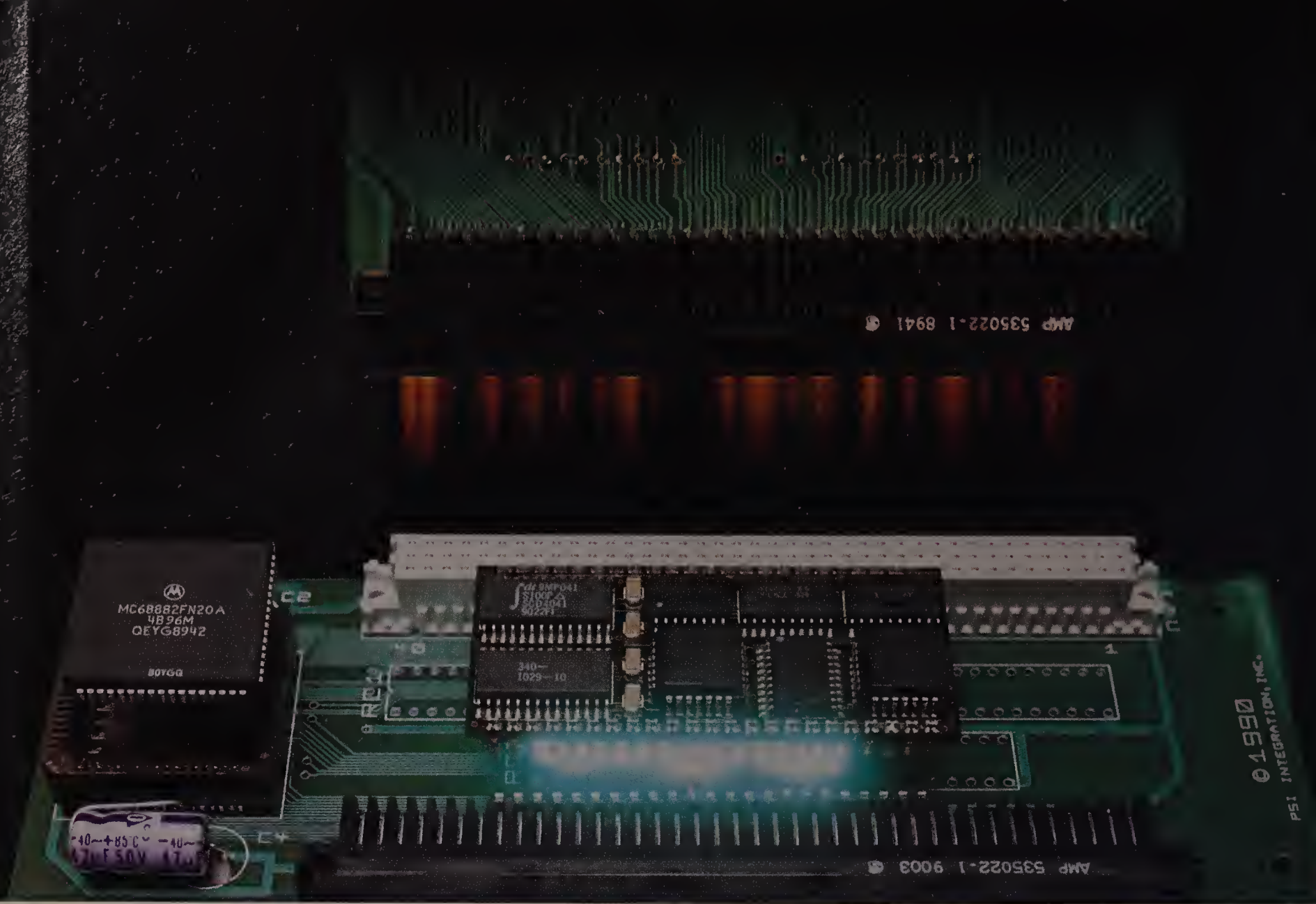

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SAM, which requires you to use the separate Virus Clinic, Rival lets you wipe out the virus as soon as it attacks.

Rival has five modes, all accessed from the Control Panel. The Volumes mode lets you check and/or repair individual files, folders, or whole disks or drives. The Floppies mode checks and ejects floppy disks. The Report mode gives you an analysis of the disks and drives you've checked. The Vaccine mode shows which vaccines are currently installed. And the Help mode is an excellent online help file.

Rival, like SAM, can be updated as new viruses appear, but instead of typing in parameters, you need to install a small (2K to 4K) vaccine file. Microseeds makes new vaccines available on its support forums on CompuServe, America Online, andMicroseeds' own BBS, the Virus Express service, which costs $50 and entitles you to receive the next six vaccines on disk. User groups can get a free subscription to Virus Express, and are encouraged to distribute the vaccines.

The Right Prescription

Both programs have excellent online help and manuals, and technical support was very good from both companies. In tests with viruses, an unaltered SAM 2.0 caught the WDEF virus but missed the ZUC (Zucchini) virus. After I added the ZUC virus search string with SAM Virus Clinic, the programs stopped the ZUC virus cold. Rival, which came with vaccines for ZUC and WDEF installed, stopped both viruses before they spread or infected my hard drive. Both programs removed the viruses from my hard drive and disinfected floppy disks with no problems.

For the average Macintosh user, I recommend Rival. It's completely transparent in operation, does a good job in preventing virus infections, and has more built-in vaccines. More-advanced users, or anyone who manages networks, should get SAM for its excellent customization features and its extensive scanning options. Whichever program you get, be sure to contact the manufacturer from time to time and get the latest updates, so that you are protected from the warped ingenuity of the virus authors.—**Tom Negrino**

See* Where to Buy *or circle 747 (Rival) or 769 (SAM) on reader service card.

Disk Utilities

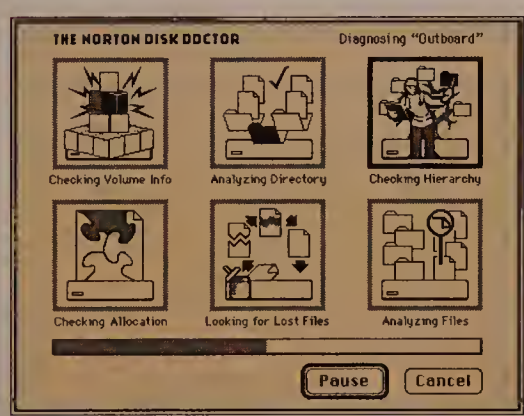
THE NORTON UTILITIES FOR THE MACINTOSH 1.0

Pros: Excellent file-recovery tools; fixes many types of directory and file damage; wide variety of utilities.
Cons: UnErase doesn't show the amount of free space on the destination disk; still can't fix all disk problems.
Company: Symantec Corporation.
Requires: Mac Plus. **List price:** $129.

A hard drive will crash sooner or later, and the best way to deal with it is to be prepared. Norton Utilities for the Macintosh provides an excellent suite of recovery tools. The programs also do a good job of recovering files on floppy disks that have crashed. In addition to file recovery, there is a smorgasbord of other disk utilities that help keep your hard drive and floppy disks running smoothly.

Physician, Heal My Disk

The data-recovery tools section of Norton Utilities is made up of four parts. Disk Doctor diagnoses and repairs damaged or crashed floppy disks or hard drives. It scans a disk, alerts you to problems as it finds them, and asks if you want to fix them (see "Say 'Ahhh'"). UnErase recovers files that have been accidentally deleted. Format Recover resurrects hard drives that have been mistakenly erased, or that have crashed. FileSaver is an INIT and Control Panel device that creates invisible files containing the information needed by Format Recover and UnErase's QuickUnErase mode to restore the data. These files are invisible and take up less than 1 percent of a hard drive's disk space.



Say "Ahhh" Disk Doctor is on its rounds here, checking the hard drive called Outboard. If the program finds any problems, a dialog box appears, detailing the problem and asking if you want to repair it.

Disk Doctor is unique among Mac utilities in that it attempts to correct problems on floppy disks and hard drives; competing products merely allow you to recover data from damaged hard drives. Disk Doctor successfully fixed most of the floppy disks I tried it on, failing to fix only 1 of more than 20 bad floppies. Disk Doctor had more difficulty with hard drives. Some hard drives required more than one pass to fix all the directory problems, and the program reported that it couldn't fix some problems at all, specifically some Volume Information Block damage. Still, Disk Doctor fixed 7 out of the 10 hard drives I tested.

FileSaver keeps a record of all the documents, applications, and folders on a disk or drive. FileSaver also keeps track of all the files that have been thrown in the Trash.

QuickUnErase uses the FileSaver data to show you a list of recently deleted files, along with their chances of recovery, from Excellent to Poor. Recovering files is as simple as selecting them from the list, picking where you want the recovered files to be placed, and clicking on the UnErase button. You can also use UnErase on disks or drives that weren't prepared in advance with FileSaver, either by searching for files of a particular type, or by searching for a word or phrase. UnErase doesn't tell you the amount of free space on the destination disk, so if you're recovering to floppies, you can easily select more files than will fit on a floppy disk. This is not a particularly serious problem, but in a package of this caliber, it should be fixed.

Format Recover is best used on hard drives that have been accidentally erased using the Finder's Erase Disk command. In reality, when you choose Erase Disk, the Finder doesn't scrub the information off each sector of a hard drive; it just writes a new, empty directory to the drive. Format Recover first searches the hard drive for the FileSaver information, then uses

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it to restore the old directory. The whole process took less than four minutes on a 140MB hard drive with approximately 70MB of free space. When you use the Erase Disk command on a floppy disk, the Finder rewrites the physical format of the floppy, and no recovery is possible, however.

Not a One-Trick Pony

The Norton package includes several other utilities designed to make your life easier. Speed Disk is a disk optimizer, speeding up a hard drive by defragmenting the files so that they can be accessed more quickly. It is easy to use and works well. Speed Disk has both an Easy and an Expert mode, allowing more-advanced users more control over the optimization process. In Speed Desk Expert mode, you can actually use the Magnifying Glass icon to see which disk blocks are in use, and what files occupy them. Interestingly, Speed Disk can detect (but not fix) some problems, such as B-Tree Extents file damage, that Disk Doctor misses.

The Fast Find DA is similar to Apple's Find File but is much faster. Fast Find searched a 140MB hard drive in only a few seconds. Faster searching capabilities are only available in utilities, such as On Location, that index a hard drive. Fast Find also allows you to view the contents of files or launch files. Layout Plus, an expanded version of the shareware Layout application, lets you customize the way the Finder displays files and folders on the desktop. For example, you can change the font, size, and position of text views; the spacing and color of icons; and the appearance and behavior of windows.

KeyFinder is a DA that displays the entire set of characters of a font and the keystrokes that produce the character. Directory Assistance is an INIT that brings some of the functionality of the Finder to the standard Open and Save dialog boxes. It adds File and View pop-up menu buttons to the dialog boxes. The File menu lets you create a new folder, duplicate or delete files, Get Info, or quickly locate a file on the current volume. The View menu sorts the file list by name, date, or file type. (Unfortunately, Directory Assistance in version 1.0 is incompatible with the excellent Boomerang utility, which also adds a pop-up menu to the Open and Save dialog boxes.) And last and certainly least, there's DiskLight, an INIT that puts a small icon in the menu bar that flashes whenever there's any floppy disk or hard drive activity. It's mainly useful for people with internal drives that don't have a visible activity LED.

Norton Utilities comes with extensive online help and an excellent user manual. The manual includes a series of step-by-step procedures for recovering crashed disks, with separate procedures if you've previously installed FileSaver and if you haven't. The Norton Disk Companion, sent to all registered users, explains in a way that anyone can understand such things as how the Mac stores files and how hard drives work.

Disk Doctor and UnErase are very good, but they're not yet a complete replacement for other disk utilities. Although Norton can recover or fix a wider range of hard drive problems than can Symantec Corporation's Symantec Utilities for Macintosh (SUM II 2.0), the latter was able to recover some hard drives that Norton could not, and vice versa. In cases where both utilities could recover a drive, Norton completed the job much more quickly. Since Symantec recently acquired Peter Norton Computing, it will be interesting to see whether the two packages stay separate or merge together.

Prognosis: Very Good

Norton Utilities for the Macintosh is an impressive first Mac entry for Peter Norton Computing and sets the pace for the competition. Although there are still a few rough edges to the software, it far outpaces Symantec's SUM II and Central Point Software's MacTools Deluxe in ease of use, speed, and the ability to recover a wide assortment of crashed and damaged floppy disks and hard drives. And the additional utilities included make the Norton package an excellent value. I highly recommend the software, and I also recommend that you start using it before your drive crashes.

—Tom Negrino

See Where to Buy or circle 710 on reader service card.

Word Processor

NISUS 3.01

Pros: Wealth of editing features; superb keyboard controls; sophisticated search-and-replace function. **Cons:** Sluggish on a Mac Plus; lacks word count. **Company:** Paragon Concepts. **Requires:** Mac Plus; second disk drive. Hard drive recommended. **List price:** Version 3.04 $395.

If God can be found in the details, the developers of the Nisus word processor must be enjoying the divine presence regularly these days. There are still some gaps to fill, but Nisus has already been endowed with a broader and more sophisticated collection of tools for the serious writer than any other comparable program.

Deluxe Text Editor

While Nisus holds its own against Microsoft Word and WordPerfect when it comes to document layout and text formatting, it's as a text editor that Nisus really stands out. Unique and genuinely useful extensions to standard editing features abound. Take text selection, for example: you can select anything from a single word to a whole document with successive mouse clicks. You can also select noncontiguous portions of text—one word here, a phrase there, maybe a full sentence in another spot—and

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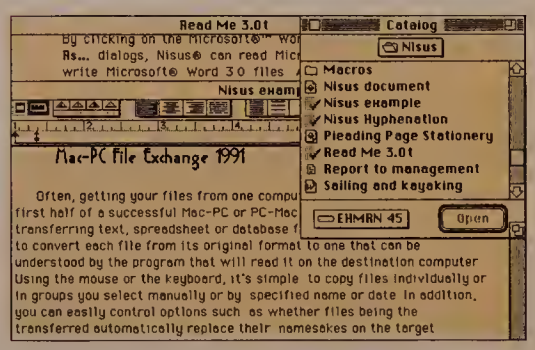

Cataloging Your Files Leave open Nisus's Catalog window, shown here in the upper-right corner, and you have immediate access to file-management functions. Files that are already open appear with a check mark icon. From the list, you can open, move, delete, or rename multiple files at once. By the way, a Nisus stationery file is a template document—it opens as untitled so that you can embellish it without altering the original.

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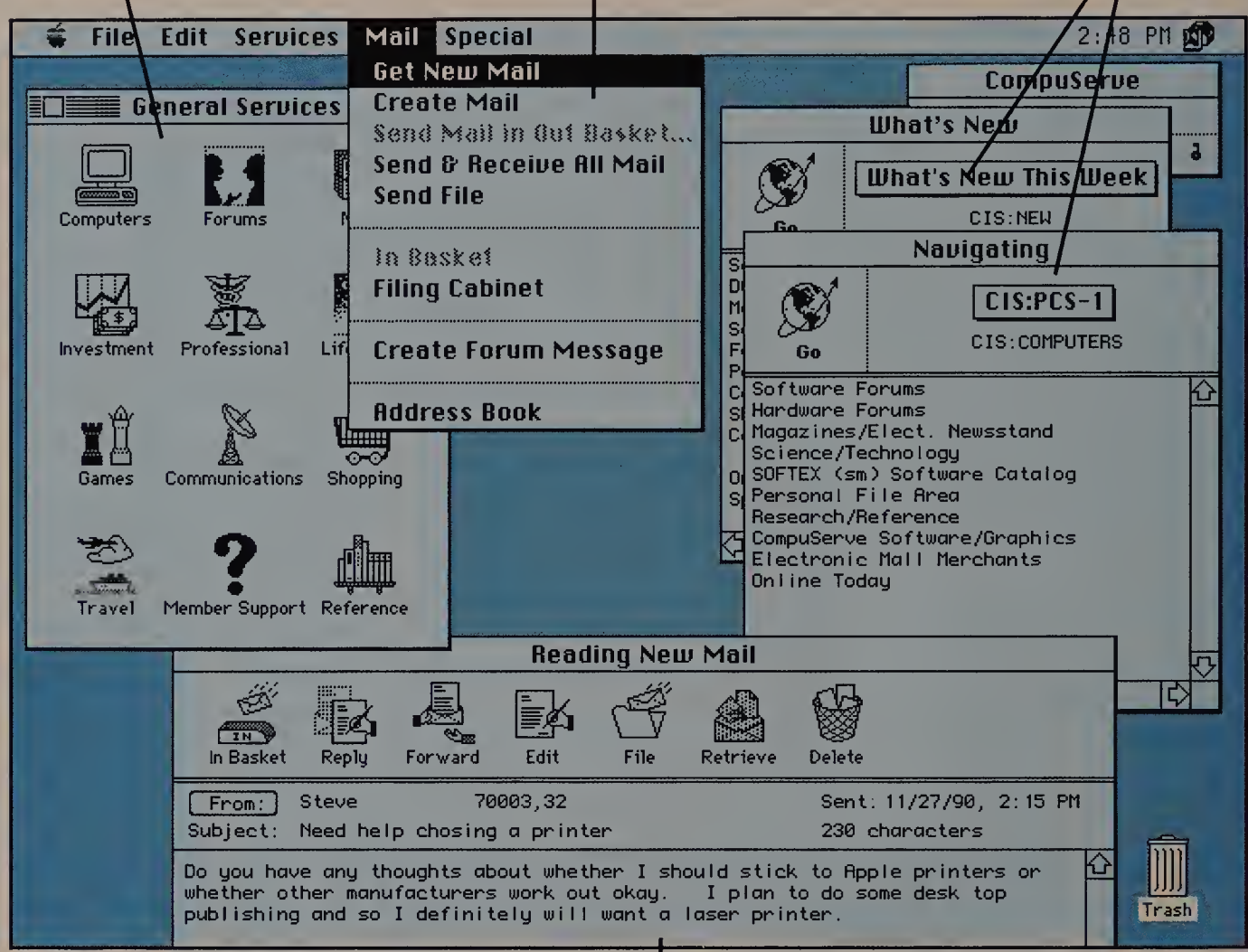

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*Suggested retail price.

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delete them all or change their appearance with a single command. And you can select text vertically, which is great for preserving the format of tabular information when you're moving it around in a document (alas, Nisus lacks a true table-editing function).

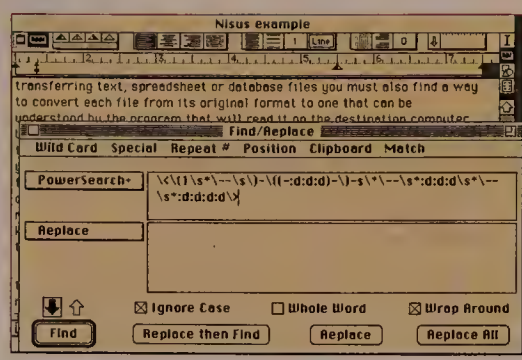
A Place for Everything

If you've ever wanted a cubbyhole where you could park a passage of text you might need later on, one of Nisus's ten clipboards should suffice. After you cut or copy the text, you just switch to another clipboard and continue editing, cutting and pasting as necessary. When you're ready to retrieve the original text, you switch back to the appropriate clipboard and paste. Nisus's cut-and-paste feature has another thoughtful touch, an option that ensures that one and only one space remains between words after a cut or a paste.

Three distinct search-and-replace functions offer three levels of power and complexity. The garden-variety Find/Replace command can comb a file in either direction; the other two functions let you carry out sophisticated document transformations with relative ease. It's a snap to hunt down text attributes like font or style changes, or locate special characters such as tabs or line ends—you just choose the attribute or character you're interested in from a menu. But the real boon is the ability to search for patterns, not just specific characters, and to locate text according to its relative position in the document. For instance, you could find all numbers between 5 and 87, locate capitalized words that don't begin a sentence, or find a text string only if it comes immediately after a particular character. To top it off, all three search functions work on closed files, making Nisus a more powerful text-retrieval tool than Gofer.

Undo It All

There's an Undo command, of course, but it doesn't poop out after one or two uses—you can reverse the effects of almost 33,000 prior commands, assuming memory permits. The program will compare any two open files for you, or let you synchronize two open files so that they scroll in lockstep as you scrutinize them yourself. You also get a competent spelling checker and thesaurus, a glossary for expanding abbreviations into complete words or phrases, and a host of little creature comforts that speed editing chores, help eliminate errors, and facilitate file management. There is, however, one useful feature conspicuous in its absence—a word-count routine.



Power Searching The most powerful of Nisus's three find-and-replace functions is called PowerSearch+. It requires entry of dense programming language–like expressions, but at least you can enter them by picking them from the menus. The sample shown here locates any telephone number in a document, whether it's written as (415) 555-1212, 1-415-555-1212, 555-1212, or virtually any way, depending on a complex series of wild-card operators.

Fully Featured Formatting

If I seem to have slighted Nisus's formatting capabilities, it's only because the program's text-editing features are so impressive. In fact, if you require finer control over layout and typography than what Nisus offers, you probably need a desktop publishing program. Some highlights: each paragraph can have its own ruler; and you can copy rulers from one paragraph to another to set margins, line spacing, tabs, and other characteristics with a single command. For more extensive formatting chores, a full style-sheet system is provided. You can change the layout of headers and footers on every page if you like. Pagination is automatic.

Imported PICT graphics can be placed on the underlying page or directly into the text stream. You can even edit graphics—Nisus's built-in drawing tools may be superfluous for most hard-core writers, but even they may consider them as occasionally useful extras.

Nisus deals a dual blow to the perpetually irksome problem of file exchange. The first component of the solution is conventional: the program effortlessly reads and writes Microsoft Word and MacWrite files, retaining nearly all text formatting in the process, and comes with import filters for PageMaker 3 and 4. But what makes Nisus unique is the way it handles its own files. In them, the program stores formatting information—ruler settings, font and text style changes, and so on—separately from the text itself. Nisus documents thus appear as plain text files to other programs, and can be opened as such. Likewise, you can transfer a Nisus file to a PC or other type of computer without a translation step.

Taming the Program

Obviously, taming a program of this depth requires some work, but Nisus provides you with the necessary tools. Lots of keyboard shortcuts are built into the program (in fact, every option in the dialog boxes has one), and it's extremely easy to create your own for any menu command. More than a simple key-stroke recorder, Nisus's macro feature provides a full programming language. It can even run DAs as part of complicated macros that bring back text or numbers to your document and paste them in.

Learning the program could have been made easier, however; the large manual is incompletely indexed, while the online help system is too slow and is organized around Nisus's menus rather than according to tasks you might want to perform.

Nisus suffers from one overall shortcoming, a sluggishness on the screen that's particularly noticeable on slower Macs. The program's performance isn't awful, mind you, it's just that there's a brief delay when you open menus, type text, or display a new file.

The better-known word processors have more text-editing power than most people need. But if you want the ultimate software for expressing your thoughts in writing, Nisus has the rest of them beat.

—Steve Cummings

See **Where to Buy** *or circle 709 on reader service card.*

Go Tutorial Software

GO JUNIOR

Pros: Best introduction to go yet developed; extra entertainment features. **Cons:** Beginners might want more online help. **Company:** Toyogo. **Requires:** Mac 512KE. **List price:** $35.

Tic-tac-toe succumbed to computer analysis in the late 1940s, on computers with less than a kilobyte of memory. By 1990 the best chess programs on large computers could challenge chess players up to the master level. But go, the 4000-year-old pastime that's the national game of Japan, is another matter. It's deceptively simple—opponents try to enclose areas on a board by placing black or white stones at points on a grid—but calls for considerable ability in pattern recognition, an area far from its ultimate development as a branch of computer science.

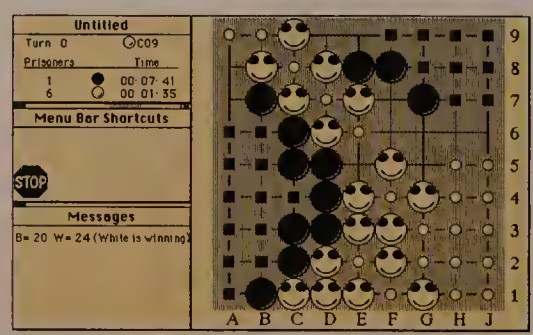
Ten years ago some go authorities were confident that no computer version of go would make even a useful sparring partner for beginners. Then a number of programs appeared, the best of which could play near the local go club champion level (more on go's remarkably precise ranking scheme below). The most successful commercial go program for the Mac has been the Nemesis Go Master from Toyogo, based on an innovative approach to the game described by Bruce Wilcox in a series of papers exploring optimal go strategy for human players.

Let's Go

The basic Nemesis program is strong enough to beat any beginner who's not a native genius at the game. It contains lots of options that help midlevel players but won't do much for neophytes. Toyogo has therefore produced Go Junior, a program specifically designed for introducing go to beginners. It's friendly almost to the point of goofiness, has settings that allow beginners to win one often enough to maintain interest, and takes into account the traditional sequence of stages of personal go-playing development.

When you start up Go Junior, the default board that appears is the 9-by-9-vertices board used to teach beginners but which is also used in mini-tournaments for elementary school students. This board (compared to the full-scale 19 by 19 board) allows you to learn the basic rules for capturing stones and enclosing areas in go, and get practice at fighting and winning small-scale battles. The idea is that when you know how to handle conflicts involving a few stones, you can begin to study the strategies necessary for decent play on a larger board—play at 19 by 19 is qualitatively much subtler than at 9 by 9, where the action often resembles simpler games such as the popular Othello or Pente. Since the basic representation of go on a black-and-white screen is stunningly austere, Toyogo has tossed in some nontraditional touches to keep young persons amused: captured stones assume unhappy faces and make Pac-Man-like exits from the board, the program announces "atari" in a synthesized voice, and a call to the automatic scoring function (a double-click on the calculator icon) shows the winning color grinning triumphantly (see "Win with a Grin").

As an instructional aid Go Junior preserves the settings-flexibility of Toyogo's advanced products. You can call for handicaps up to nine stones (a handicap means you get free stones of your color to place on the board at the beginning of the game) and set your computer opponent to play levels from 13 to 35 *kyu*. In go's meticulously developed ranking scheme, 35 kyu is the rating of a guy who just walked out of the dorms into a university go club by mistake, while 13 kyu is the much better rating of a smart person who has been practicing diligently for perhaps a year. (Once you go past 1 kyu, you enter the realm of expert rankings, reckoned in *dan*. For reference, 1 dan is the lowest, the 9-dan Japanese professionals are basically the best on earth, and America now has a few 7-dan players.)



Win with a Grin Toyogo's scoring function for Go Junior is a bit more lighthearted than the same function in the advanced products. These jolly faces appear with a call to the scoring function (available through a calculator icon normally shown in the Menu Bar Shortcuts window).

For tutorial purposes, this setting range is perfect. In tests with beginners (ages 7, 14, and 32), the 7-year-old, for example, was delighted to find that he could win 9 by 9 games at a five-stone handicap with the program set to 35 kyu. The other test subjects rapidly calibrated themselves with the simplified (compared to Toyogo's fancier products) settings menu. The oldest subject, who has had a long-standing desire to learn go (and a Ph.D. in physics) found that she could play at the 20-kyu level on a 19 by 19 board after playing for several hours per day for two months and virtually memorizing Wilcox's *Instant Go* handbook. Go Junior won't play any higher than this—the manual notes that if you can beat this program on the big board at that level, it's time to challenge Go Master itself.

In Black and White

In an earlier review, *Macworld* called Nemesis Go Master the best way to learn the game. Now we have Go Junior, optimized for teaching beginners, and it's even better as an instructional product. At $35 suggested retail, it's cheaper than most crummy plastic go sets, but at most mail-order discounts, it's cheaper than desperately crummy *cardboard* sets, not widely available in the United States anyway. If you live in many parts of this country it may be the only way to learn go, and even if you live in Honolulu, it's still probably the best.

Please be warned that this game is addictive, is more interesting than all but the most engaging jobs (it has in fact interfered with more than one math career), and makes most other board games seem childishly unsophisticated. Those cautions having been stated, Go Junior may be recommended absolutely.

—Charles Seiter

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Football Strategy Game

PLAYMAKER FOOTBALL 1.0

Pros: Intellectually exciting; simulates coaching experience. **Cons:** No color; arcade aspects superfluous. **Company:** Brøderbund Software. **Requires:** Mac 512K. **List price:** $49.95.

Playmaker Football is a thinking sports fan's computer game. If you're a Monday-morning quarterback who revels in analyzing the subtleties of play design, play selection, and the all-important draft, Playmaker is your game.

You're the Coach

Playmaker Football simulates the entire experience of coaching a football team, from drafting and developing players in the Team Draft mode, through designing plays on the chalkboard in the Chalkboard Editor, to calling plays on the field in the Game Mode. Decisions you make in each of Playmaker's modes contribute to your team's success or failure in a game.

There are several ways to play Playmaker Football. The easiest way is to use 2 of Playmaker's 13 ready-made teams in the Game Mode. The teams have names like the Pluguglies, the Whammers, and the Badmen—and players with names like quarterback Johnny Awesome and guard Obsta Kul. Each team comes with its own playbook, from which you can choose one of about 70 unique offensive, defensive, or special plays for each down.

The playing field is seen from above, with each player represented as an animated figure. Although small, the players are animated adequately for you to see and understand the action on the field (see "Hike!"). Unfortunately, Playmaker gets a five-yard penalty for its lack of color graphics.

Digitized sound effects of players grunting and crashing into each other add bone-crunching realism. Audience applause and boos punctuate good or bad performances.

Picking the Plays

In coaching a ready-made team, the name of the game is play selection, choosing which of the 70 plays is best for your situation. On each down Playmaker lets you call either a running, passing, or special play; or you can call a corresponding defensive play. Unlike Accolade's 4th & Inches, which gives the user no control over play calling, Playmaker lets you call plays through a dialog box that allows you to choose from a list of all plays or from a list with only one type selected—running, passing, or special.

Calling plays for Playmaker's ready-made teams can make for gripping action. And you have to call them quickly, because the computer referee gives you only 45 seconds to pick before he slaps your quarterback with a five-yard delay-of-game penalty.

Manual Fumbles

You can control where your quarterback throws the ball by pressing the Option key and clicking on a point on the field, but I found this to be a surefire way to get an incomplete pass or an interception. It's also possible to control the direction of the ball carrier. Once again, I found it better to defer to the computer's judgment.

When your team is on defense, pressing the Option key gives you control of the middle linebacker, which is quite useful for going after receivers and will usually help your game. And you can make your return man call a fair catch by pressing the space bar, or have him let it bounce by hitting delete on punt returns.

Building Your Team

Playmaker's Team Draft module displays the pictures and gives data on your 30 players (15 on offense and 15 on defense). Double-clicking on a player's picture brings up a bar chart displaying his speed, strength, intelligence, agility, and discipline. Each player can have a maximum of 100 points in each of these categories.

While the football purist may chafe at using this unusual rating scheme, the Playmaker point system makes it possible for each coach to field a team with an equivalent amount of talent. By allotting a maximum of 7500 points to distribute among the players, Playmaker prevents coaches from making every player on their team a superathlete.

Hike! A view of the field in Game Mode as the Whammers line up to run HB Screen L against the Buckwings' tough 4–2 WS Double Cover defense.

You can use these points to concentrate on your attack. For instance, the Whammers' fullback, Hefty Hunter, comes with a strength rating of 100, a speed rating of 80, and an agility rating of only 60. In order to beef up the Whammers' sagging running attack, I reduced wide receiver Fingers McCoy's discipline rating from 100 to 60, and used the extra points to make Hefty faster and more agile. In the next game, the Whammers' running game improved dramatically, and my computer opponent—programmed to focus on hot players—began to concentrate more on my fullback, allowing me to get away with more passes.

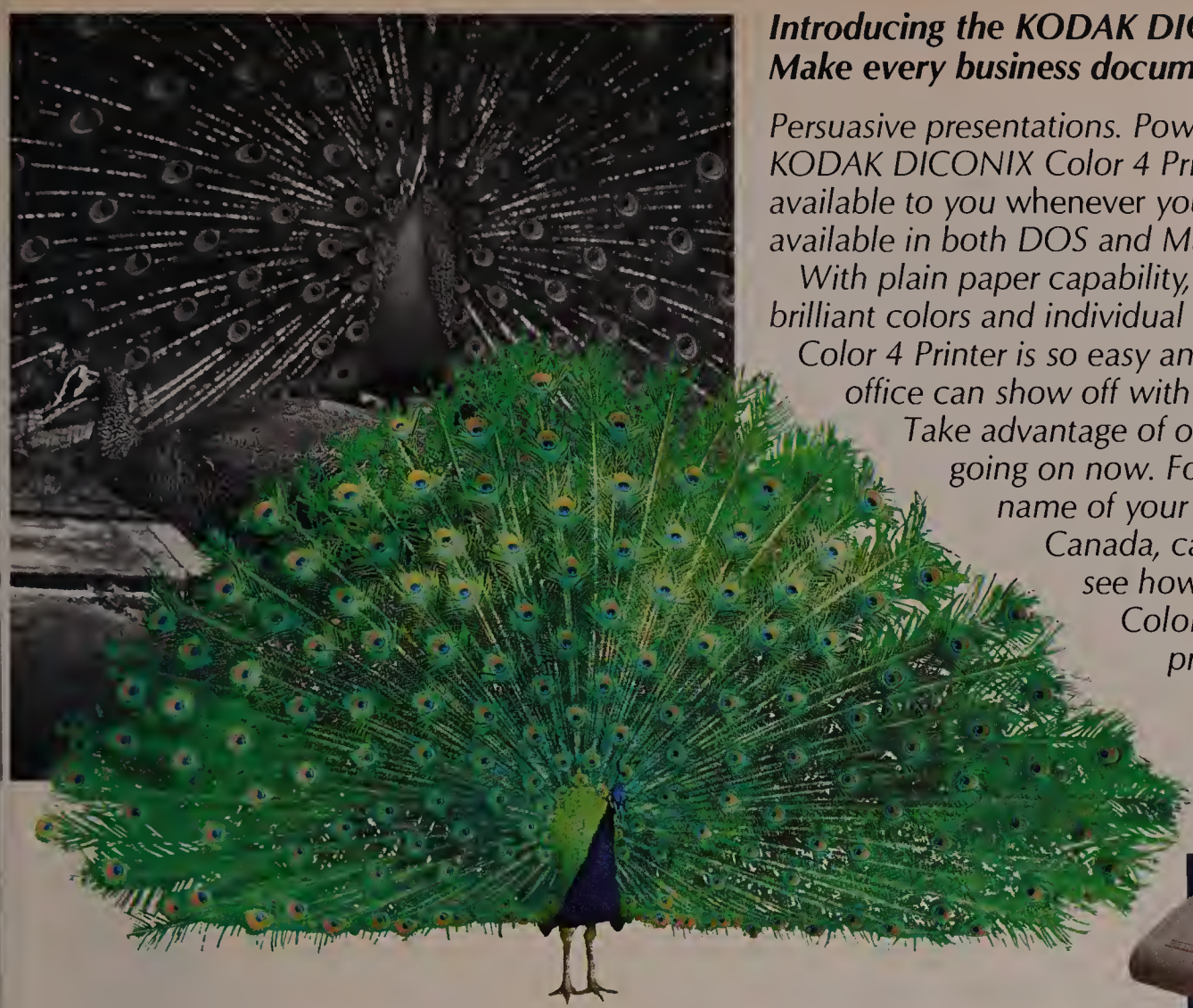
Chalk Talk

The last module of the game is the Chalkboard Editor, which lets you both design plays from scratch and alter plays from a playbook. The first time I designed an offensive play from scratch, I added it to the Whammers' playbook and watched glumly as the opposing team smashed through my line and sacked my quarterback. A better way to start designing plays with the Chalkboard Editor is to use an existing playbook play that already has a solid blocking scheme.

Finally, the Chalkboard Editor allows you to teach the computer your coaching style, in effect training an assistant coach that can take over for you in the Game Mode. Each play has a corresponding Artificial Intelligence Window, which allows you to set how frequently a certain play will be called or in what situation it will be called when you let the computer coach your team.

Overall, Playmaker Football is the best football game for the Macintosh I've ever played.—**Jonathan Cassell**

See **Where to Buy** *or circle 721 on reader service card.*



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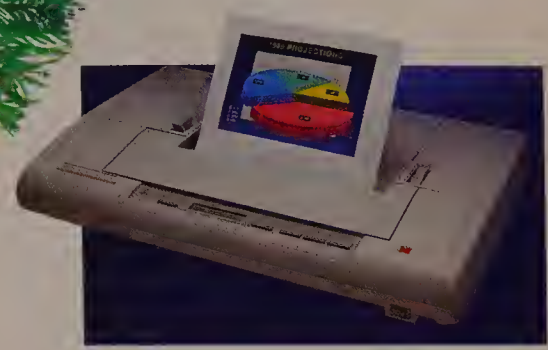

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Customizers

CLICKCHANGE 1.01

Pros: Provides many predefined examples; imports/exports elements; has powerful editor for creating animated color cursors. **Cons:** Synchronous sounds. **Company:** Dubl-Click Software. **Requires:** Mac Plus; System 6.0. **List price:** Version 1.0.3 $79.95.

PERSONALITY 1.0.1

Pros: Asynchronous sounds; can selectively disable features to resolve compatibility conflicts. **Cons:** Limited alternatives to standard Mac elements; some compatibility problems; expensive. **Company:** Preferred Publishers. **Requires:** Mac Plus; System 6.0.2. **List price:** $99.95.

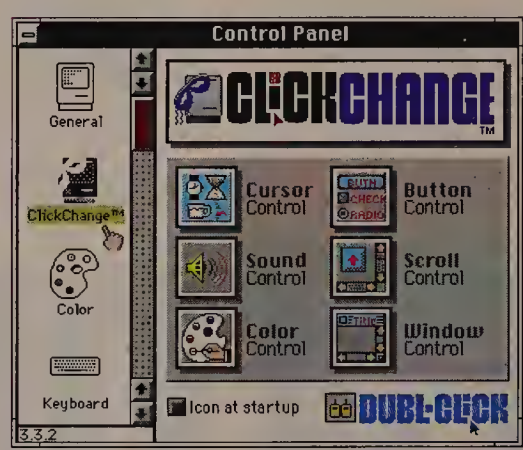
Face it. Nobody buys screen savers like After Dark or Pyro to prevent phosphor damage to their monitors. You buy them because they make your Mac—and by association, yourself—look cool. Period. Aside from helping you express your individuality, such "utilities" are virtually useless, but they're a lot of fun nonetheless. The same can be said of ClickChange and Personality, a new breed of Control Panel devices (cdevs) that offer the capability to customize the Mac's look-and-feel (and sound, if you want to get technical). With either cdev you can replace the standard interface elements—cursors, windows, buttons, colors, and sounds—with funky alternatives that are bound to make your friends green with envy. While both products have remarkably similar feature sets, they are worlds apart when it comes to functionality.

Both utilities work basically the same way. You copy the cdev into the System Folder of the start-up volume and then restart so the INIT (start-up document) portion of the file is loaded into memory. The INIT hangs around waiting for other applications to call standard toolbox routines—the Mac's internal utilities that define windows, dialog boxes, buttons, and so forth. When the INIT spots a toolbox call that you have customized, the INIT substitutes its own alternative definition for that of the Mac. The result is that you can slap different front ends onto the Mac's interface easily and often.

When first accessed through the Control Panel desk accessory, ClickChange and Personality look like twins. They both have large buttons that, when pressed, present options for changing standard Mac elements such as cursors, buttons, sounds, windows, and colors. That is where the similarity ends, however. Because once you actually delve into these utilities, a cursory comparison quickly reveals that ClickChange is by far the superior product.

Crazy Cursors

The superiority of ClickChange is nowhere more obvious than with the cursor options. Personality gives you 8 arrow cursors of different colors to choose from (on a monochrome monitor, however, they all look the same). ClickChange, on the other hand, comes with 83 animated cursors of all types. There are dogs that do backflips, rotating cubes, bouncing balls, flying HeloCars, and so on. Additionally, the powerful built-in editor allows you to modify any of the existing cursors, or design your own from scratch. You can then export your creations and share them with other ClickChange owners.



ClickChange The ClickChange cdev in a Microsoft-inspired Control Panel window. Note the pointing-hand cursor, Next-like check box, and the scroll bar with double arrows and proportional elevator.

Personality This slightly 3-D Control Panel is one of only two alternative window definitions in Personality, indicative of the overall dearth of options offered.

Sound F/X

Like the shareware offering SoundMaster, both utilities let you link particular sound effects to Mac events. For instance, the Mac can say "good night" whenever you shut down. Of course, you need the digitized "good night" sound resource file. Preferred Publishers leaves that up to you with Personality, cavalierly recommending that you create your own sound files with Farallon's MacRecorder, or get them from online services or user group libraries. Dubl-Click, on the other hand, goes the extra mile, providing with ClickChange 31 fun sounds that can be imported into your System file to supplement the standard boing, clink-klank, monkey, and simple beep.

Due to Personality's use of a pop-up menu, assigning sounds to events in that program is unintuitive and laborious. It does, however, have two advantages over ClickChange. First, Personality's sounds are asynchronous, which means that you can continue using the Mac while the sounds play. With ClickChange's synchronous sounds, the Mac halts operation until the chosen sound has been played. The other advantage of Personality is that it can choose randomly from several sounds tied to a single event.

Chameleon Colors

If you're bored with the standard Mac colors for elements such as menus, windows, and buttons, ClickChange and Personality allow you to change them to whatever colors you like. Both utilities work exactly the same way: click on an element and then choose a color from the Mac Color Picker. Yet again, ClickChange does Personality one better by allowing you to name different color combinations and save them as sets (the package comes with 28 predefined sets for you to choose

(continues)

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Circle 172 on reader service card

from). Making multiple color changes in Personality, however, soon becomes an exercise in tedium because there is no way to save default sets.

Window Dressing

It is ironic that shortly after Microsoft gave IBM-clone owners the ability to mimic the Mac with Windows 3.0, both ClickChange and Personality came along offering Macintosh users sample alternative window designs. With its eight options, ClickChange gives you a taste of what it's like to use the point-and-click interfaces of Windows or the Next and Sun Microsystems workstations, to name a few. Personality, on the other hand, offers only two three-dimensional alternatives to the standard Macintosh window, neither of which is very inspired.

Button Blowout

With ClickChange, you have six different styles of buttons from which to choose. Aside from the standard buttons, Personality offers only one 3-D alternative. To make matters worse, Personality places a gray background behind all button text, which makes dialog boxes cluttered and all but unreadable.

While their feature sets are more alike than different, the two programs do have features unique to each. Personality allows you to change the standard menu font (Chicago 12) to any font installed on the Mac. Furthermore, an option gives the menu bar and menu items a 3-D look. I wasn't able to get this feature to work correctly until I removed almost all of the INITs from my System Folder, and even then this feature seemed to suffer from some compatibility problems. Luckily, Personality has the ability to selectively disable its features within certain applications to resolve such compatibility conflicts.

ClickChange differentiates itself with a unique scroll bar feature. There are six different styles of scroll bars to chose from—from Next-like to slightly 3-D—and you can request double arrows at the end of each scroll bar if there is room. With double arrows, you needn't move the cursor to opposite ends of a scroll bar just to move around within a document. Just click on the appropriate arrow. Very handy, especially for owners of large screens. Another nifty feature is the proportional elevators option in the scroll bars. Instead of always being the same ¼-inch square, an elevator's size changes to approximate the proportion of the information displayed in a window to the total size of a document. This feature is part and parcel of the Apple IIGS operating system, and should be adopted for the Macintosh too.

Telecomputing modem jockeys can probably download a collection of public domain and shareware INITs and cdevs that perform some of the same functions as Personality and ClickChange, but there's no guarantee that they'll work together. If you really want to impress your friends and put a little fun back in your Mac, ClickChange is clearly the way to go. It's a comprehensive collection of fun goodies executed in an extremely professional package. Feature for feature, it blows the doors off Personality, and as the coup de grace, it's less expensive.—**Owen W. Linzmayer**

See Where to Buy or circle 628 (ClickChange) or 716 (Personality) on reader service card.

File-Transfer Kit for the Tandy WP-2

WPDUET

Pros: Kit includes cables; works with any Mac; quick and functional.
Cons: Transferring files from Mac to Tandy slightly confusing.
Company: Cabochon. **Requires:** Mac 512K. **List price:** Version 1.01 $99.95.

The Tandy WP-2 is a flat, notebook-size, portable laptop word processor from Radio Shack; it costs $350 but is often on sale for $300. Its blue-on-yellow LCD display shows eight clear lines of text, the full page width across. Of all the non-Macintosh portable operating systems, the WP-2's might be the most comfortable to Mac users: you select text by highlighting it, choose commands from menus, and copy and paste text between documents. (It's much easier to use than, say, the Cambridge Z88.) There are immediate pop-up help screens everywhere; the most important 26 commands are

MARK JOHANN

Thanks to Cabochon's WPduet cable and software, the Tandy WP-2 is the traveling Mac user's latest laptop option. At under $350, this thesaurus– and spelling checker–equipped portable won't cripple your checkbook either.

painted right onto the keyboard itself; and—unlike some Tandy/Radio Shack electronics—the WP-2 comes with an impressively lucid manual. It's safe to say that this notebook computer is among the friendliest you can buy.

There are only three limitations to the WP-2. First, its full-size keyboard feels mushy. Second, it comes with very little memory—enough to hold only about 10 pages (you can add up to six times as much memory, though). And finally, it cannot talk to the Mac.

Unless, of course, you get WPduet. There's nothing to this package—just a program and a cable. The cable has two heads at each end, ensuring compatibility with any old or new Mac. The program quickly and simply shuttles files from the WP-2 to the Mac, in the process converting them to any of several word processing formats: text only, text with line breaks, MacWrite II, or Rich Text Format (readable by WriteNow, Word, and Write).

The Word Processor Process

One end of the WPduet cable plugs into the Mac's modem port; the other goes into the WP-2's RS-232 jack. On the Mac, you launch the WPduet program—the most minimalistic, graphically void program you'll ever use. There are only two commands in the Direct menu; the one you want is "Direct connect to WP-2." A tiny status box appears on the Mac screen; that's all you're going to see through the entire transfer process.

From now on, you do all the work on the WP-2. Go to the Files screen, the WP-2's text-based equivalent of the

(continues)

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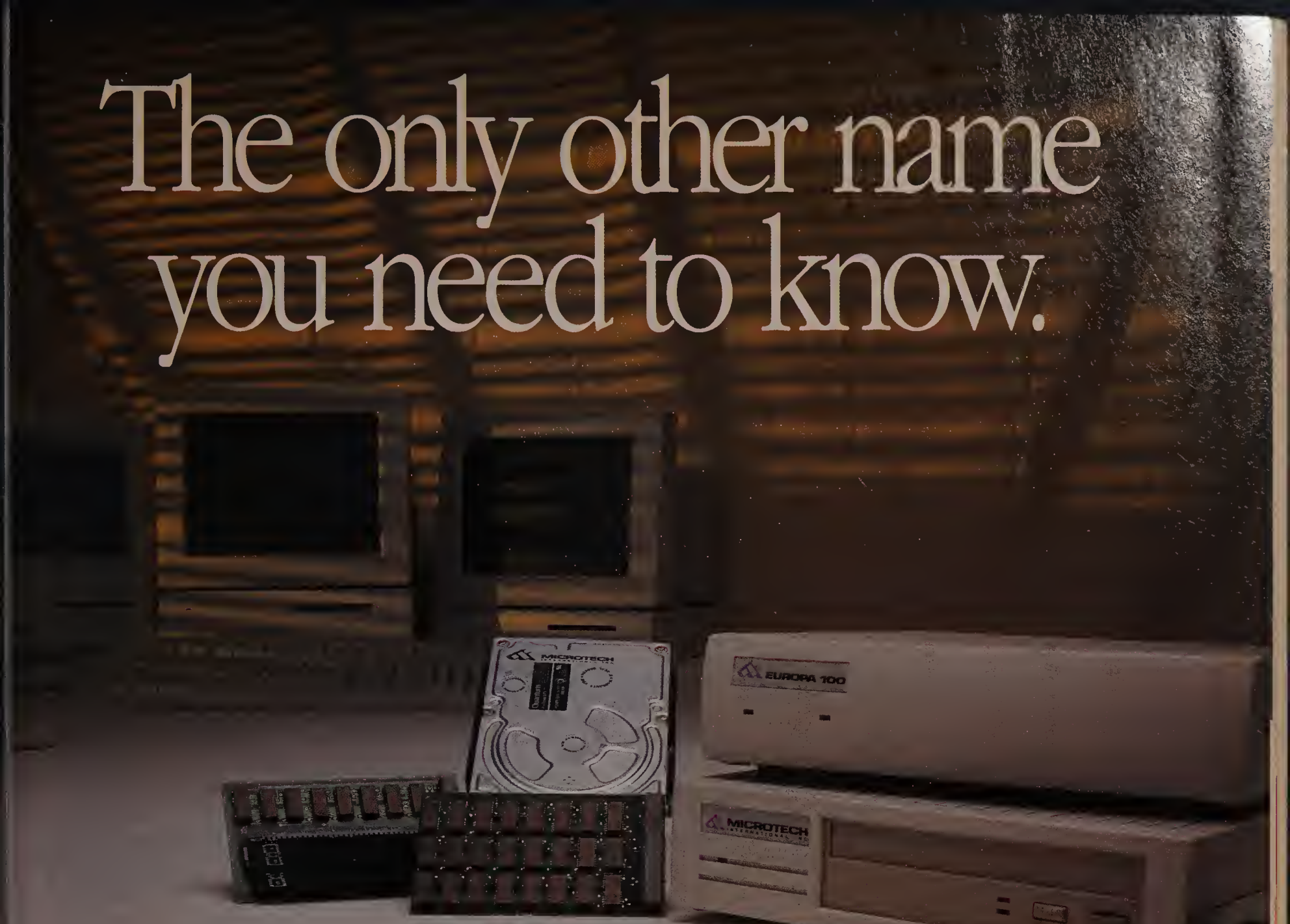

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Circle 90 on reader service card

Finder. Highlight the file you want to send to the Mac, and invoke the Copy command. The WP-2 asks where you want to send the file. One nice aspect of this machine is the many options you have for file storage: a permanent RAM disk; a 200K 3½-inch disk (if you buy the optional disk drive); an expensive, optional, removable RAM board; or a cassette tape (slow and annoying, according to Cabochon).

WPduet makes the WP-2 think that a Mac is a massive external disk drive. Therefore, you select Diskette, so that the selected file gets moved to the Mac. In a few seconds, the transfer is complete. The file has been copied to the Mac, and any bold or underline formatting you established on the WP-2 is preserved.

Duet of Features

WPduet also sends files—alas, text files only—in the other direction, from the Mac to the WP-2. What's strange is that, once again, you do all of your file manipulation using the WP-2's file-directory screen, not the Mac's Finder. And because file names on the WP-2 cannot be longer than 8 characters, Mac file names show up on the WP-2 screen in truncated form; a Mac file called 1990 Sales Figures becomes "1990_Sal.DA" (D stands for Document, A for ASCII).

Furthermore, it's a little hard to accept the fact that you're actually viewing the names of Mac files—which haven't yet been transferred—on the screen of the WP-2. Because they're showing up in the WP-2's directory window, you might incorrectly assume that they've already been transferred. Your only clue is that the word *Diskette*—meaning the Mac—is still highlighted at the top of the WP-2 screen, so you know you're viewing the Mac's directory.

The remaining problem with transferring from the Mac to the WP-2 is that the Mac's memory capacity is gargantuan compared to the WP-2's. You simply can't transfer some Mac files to the WP-2 without breaking them into smaller chunks. (The WP-2's main system memory—what you use to edit documents—is a nonexpandable 10 pages. Storage memory, on the other hand, is expandable.) In cases where the Mac file is too large, therefore, the WP-2 simply tells you, "Insufficient memory."

Diskette Duties

WPduet also transfers files to and from the WP-2's optional $200 Portable Disk Drive. This battery- or AC-powered unit is far less impressively designed and documented than the WP-2 itself (probably because it wasn't developed specifically for this machine). Nonetheless, it provides a useful and permanent storage medium for WP-2 files. It uses regular Mac disks, formatting them so that they hold only 200K apiece. The drive plugs directly into the WPduet cable; the laptop itself isn't even part of the hookup.

The WPduet interface for the disk drive is more elegant: in this mode, the portable drive's files appear in a pseudo-Finder window on the Mac screen. By clicking and Shift-clicking, you highlight the files you want to transfer, then choose "Copy selected files to the Mac"; WPduet does the rest. Other self-explanatory WPduet commands are "Copy a Mac file to the portable drive," "Initialize the disk in the portable drive," and "Delete selected files from the portable drive."

Duet for One

If you're looking for a low-cost laptop, research the Tandy WP-2. It costs hundreds less than the Cambridge Z88 (the one advertised as Mac Lite), but it comes with much less memory. The WP-2 storage-memory expansion options are as follows: a 32K RAM board (Radio Shack: $120), a 32K chip (Radio Shack, $50; third-party, $17), or a 128K chip (third-party only, $79). Each 32K buys you about 20 pages of storage. Particularly in light of its menu-driven, clearly labeled interface, the WP-2 can be a very good value.

You don't, however, have to do any research on WPduet. It does what it does, smartly and simply. Cabochon, WPduet's maker, is a one-man operation. Having noticed that there was no existing method for Mac users to reap the advantages of the friendly, inexpensive, eminently portable WP-2, this fellow sat down and invented one. Because of that entrepreneurial spirit, a sizable gang of Mac-owning writers can now hit the road.—**David Pogue**

See **Where to Buy** *or circle 789 on reader service card.*

Flat-File Database

FILEMAKER PRO

Pros: Much-improved layout features. **Cons:** Slow on Mac Plus, SE, and Classic; significant bugs. **Company:** Claris Corporation. **Requires:** Mac Plus; second disk drive; System 6.0. **List price:** $299.

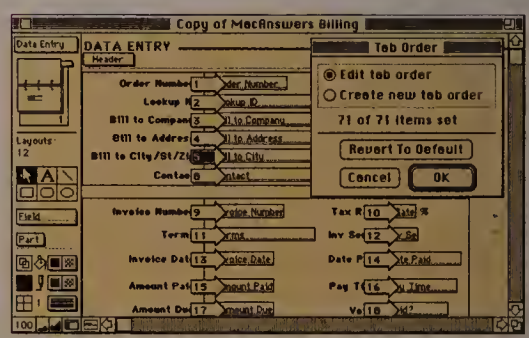
As Macintosh hardware and software become more sophisticated, so do users' expectations for new products. Claris's FileMaker Pro, the latest incarnation of the successful Mac database program, will please some new users but might disappoint longtime FileMaker aficionados who were hoping for a more substantive upgrade.

Claris changed the program in two main ways. The first was to revamp FileMaker to bring it in line with other Claris products—adding a spelling checker, the Claris Help system, and the XTND architecture, which allows for import and export with many other programs. The second was to add features based on user requests, mostly to help with designing layouts.

Layout Heaven

The new Layout features are terrific for database designers, especially if you have used previous FileMaker versions. You can name your layouts, and there's a pop-up menu in the upper-left corner that lets you switch easily between layouts. The Layout mode sports rulers and visible, user-definable gridlines. You can zoom in to 400 percent and zoom out to 25

(continues)



Smarter Layouts In Layout mode you can see several of FileMaker Pro's new features, including the Tab Order dialog, with the editable labels for numbering each field; the improved pop-up palettes for color, line, and fill; the Zoom In and Zoom Out icons; and the pop-up menu for switching between layouts.

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percent (these sizes are also available in the Browse and the much-improved Preview modes). The Size box lets you type in the exact dimensions and location on the page of a field or other object.

The ability to slide objects has been improved, and at long last, you can move objects one pixel at a time by using the arrow keys. To change the position of several objects at a time, there's an Align Objects command, which lets you line up objects' sides, tops, bottoms, or center, and if you choose, distribute objects equally along the grid. Objects can be grouped, locked in place, placed in front of or behind other objects. For easier data entry you can change the Tab Order for each field (see "Smarter Layouts"). Objects and fields can be specified as nonprinting. Color, line, and fill options are enhanced and easier to use.

One especially useful new feature is the ability to give layouts buttons that can trigger scripts or commands, or switch to other layouts. In fields that contain value lists, you can opt to show the values as check boxes, radio buttons, a pop-up menu, or a pop-up list.

You can now sort and reorder both fields (from the Define Fields dialog box) and scripts (from the Define Scripts dialog box). Fields also have a new Time category, useful for hourly billing, for example. FileMaker's calculation capabilities have been improved with the addition of 22 new functions, most of which are math and trigonometric functions, or functions that allow you to manipulate Time fields. Most eagerly welcomed is the new Summary function, which lets you perform some calculations on Summary fields.

Like FileMaker II, Pro is a multiuser database, but it uses its own unique host-guest scheme for file sharing, rather than the familiar AppleShare multiuser approach. Multiuser performance has been improved in Pro, but it would still be preferable if the database could be placed on an AppleShare file server and accessed in the standard way.

Performance Test

Despite Claris's advertising claims to the contrary, my benchmark tests showed no significant performance gains using FileMaker Pro over using FileMaker II (See "Test Track"). And FileMaker Pro is significantly slower than FileMaker II when running on a Mac Plus, an SE, or a Classic. When entering data on these machines—such as typing into fields and tabbing between them—fast keypunchers have to slow down their typing speed to match the program. Claris needs to fix this problem. Switching layouts via scripts also seems slower than before. There's sometimes a noticeable delay as menus are being opened and the menu choices appear.

FileMaker Pro is not only a much larger application (770K, versus 394K for FileMaker II), it also supports the recent trend toward requiring more RAM to run comfortably. Pro wants a 1MB partition in MultiFinder—double that of FileMaker II.

Bug Patrol

Unfortunately, this first version of FileMaker Pro comes with a generous supply of bugs. Because of a previously unreported quirk in FileMaker II files, conversions of some FileMaker II files to Pro can result in scrambled scripts, file crashes, and data loss. Claris Tech Support has a workaround that repairs FileMaker II files so they can be converted successfully, but following the suggested procedure can take an hour or more per file conversion. After you export numeric records in SYLK format for use in Excel, the records appear in Excel as text, not numbers.

Hairlines created in FileMaker II end up in Pro layouts as 1-point lines. There are problems printing to the HP DeskWriter, and printing a range of pages, say pages 3 to 5: FileMaker Pro acts as if it is printing, but no pages actually print. TIFF and encapsulated PostScript graphics can be imported and placed on layouts, but they do not print at full quality on the LaserWriter.

A particularly dangerous bug: Choosing Delete Record gives you a confirmation dialog box with two buttons, Delete and Cancel. Cancel is the outlined, default choice, but pressing the Return or Enter keys activates the Delete button! The really frustrating thing about this bug is that it's inconsistent; sometimes the dialog buttons work correctly. Claris says that a maintenance release that fixes the bugs is forthcoming but at press time had no details on when it will be available or what the upgrade policy will be. It might be available by the time you read this, so check with Claris.

It's Nice, but Is It a Pro?

The changes since FileMaker II, the last version of the program, are incremental rather than revolutionary. The slim, 16-page manual *What's New* is an unwitting testament to the lack of

(continues)

TEST TRACK All times in minutes:seconds

	FileMaker Pro 1.0	FileMaker II 1.1	FileForce 1.0	Panorama
Import	14:01	14:48	21:04	0:08
Sort	1:13	1:08	0:07	0:11
Find	Immediate	Immediate	0:53	0:02
Replace	5:27	4:42	4:38	0:03
File size	1025K	1005K	1950K	460K

Tests were performed on an SE/30, with 5MB of RAM and a 140MB hard drive, using System 6.0.4, no INITs, under MultiFinder, with AppleTalk inactive. The test file was a 5000-record name and address text file, with ten fields. All tests were single-user, with Exclusive checked for the two FileMakers. The FileMaker files that received the records were the Mail List Management template shipped with FileMaker II, slightly modified, and then converted to FileMaker Pro. The Panorama and FileForce files were simple files with only one layout. The FileForce file had 4 of 10 fields indexed, as would be done in a real-world design; FileMaker II and Pro index all fields automatically, and Panorama does not use indexes.

The Import test measured how long it took to import the entire text file. The Sort test performed a single-level ascending sort on the Full Name field, which was one of the indexed fields in the File Force file. The Find test found 58 occurrences of a text string within the Full Name field. The Replace test replaced the value in one numeric field with a new numeric value. File size was noted immediately after importing the 5000 records.

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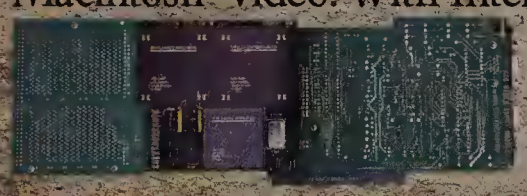

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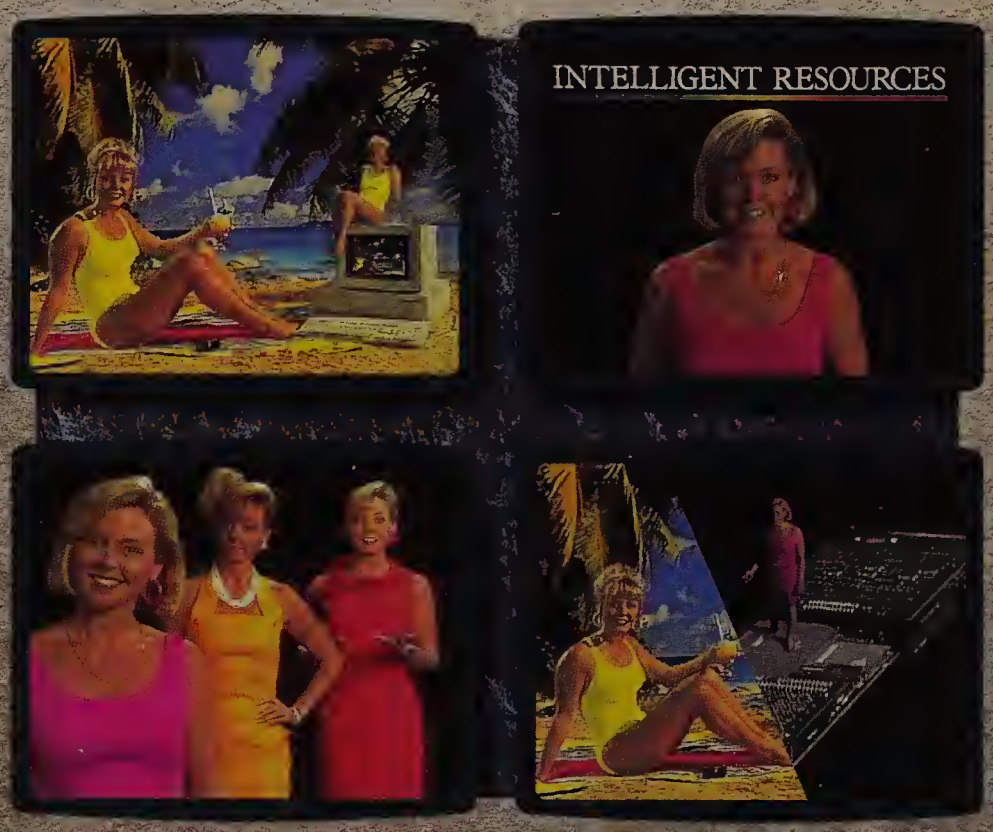

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fundamental changes. Compared to competing products such as Panorama or File Force, FileMaker Pro still comes up a bit short in the features department. As good as Pro's layout mode is, Panorama's layout editor gives the designer valuable tools, such as cluster resize and expanding objects' handles, that are unavailable in FileMaker. Pro still lacks a real macro or scripting language like Panorama's. You can't format data during data entry for such obvious things as all caps for state names, or format data as telephone or Social Security numbers, as you can in Panorama and File Force. You can format calculated fields after entering data, but the process is needlessly complex. Complex calculations must still be formatted as single, long formulas; you can't break them into easily digested pieces on separate lines in the calculation editor, nor can Buttons trigger calculations. Also, you don't have the use of variables in calculations. The program still virtually ignores punctuation marks in fields, so it's difficult or impossible to clean up data with punctuation imported from other programs.

Some of these complaints are longstanding, and yet they still haven't been addressed. Furthermore, users of previous versions will have to get used to the interface changes: Claris has changed several ⌘-key equivalents and added alert boxes where none existed before, sometimes requiring more keystrokes to do a function.

Laying Out the Choices

So what's the verdict on FileMaker Pro? Mixed. New users, and longtime FileMaker designers, will love the myriad new layout features and quickly take advantage of them to build more and better functionality into their files. But for people who have to actually enter data into those new files, things are more problematic, especially for those using 1MB Pluses, SEs, or Classics—still the majority of Macs on people's desks. FileMaker Pro is just too slow on these machines.

At Claris's upgrade price of $100, happy FileMaker II owners might decide that there aren't sufficient advantages to the new version to justify the cost, at least until Claris fixes the bugs and the speed problems. On the other hand, FileMaker Pro is still an easy program to set up and use, enhancing many of the appealing features that have made it a best-selling Mac database. At $295, it's a good value and is worth the investment. For users with Macs that have the horsepower to run FileMaker Pro acceptably, it remains a leading contender in the database wars.—**Tom Negrino**

See **Where to Buy** *for contact information.*

Hand-Held OCR Scanner

TYPIST

Pros: Recognizes multiple fonts, styles, and sizes; inserts recognized text directly into applications. **Cons:** Offers only rudimentary capabilities for scanning graphics; inadequate manual; no on/off switch. **Company:** Caere Corporation. **Requires:** Mac SE; 4MB RAM; hard drive; System 6.0; MultiFinder. **List price:** $695.

Last August, just a demonstration of the Typist was enough to make several *Macworld* editors drool and scream, "I want it!" Well, I got it. And after working with this combination hand-held scanner and optical character recognition (OCR) system, I've got—as the line goes—some good news and some bad news. The good news is that the Typist really does work. The bad news is, it has a few quirks and deficiencies Caere needs to address.

Like other OCR products, the Typist transforms scanned images into ASCII characters. But unlike other OCR programs I've worked with, the Typist isn't a stand-alone application that creates separate text files. Instead, it

MARK JOHANN

The Typist from Caere Corporation

works by flowing recognized text directly into a word processing document, a spreadsheet, a page-layout file, or whatever, as if the text were coming from the keyboard. Wherever the cursor is located in a document, the Typist inserts text.

The Typist recognizes 6- to 72-point type in any nonstylized font, in 11 Latin-alphabet languages. It can handle output from a variety of sources: typewriters, laser printers, typesetters, newspapers, even dot matrix printers. You can also use the Typist to scan images, although it's clear that Caere doesn't see image scanning as the Typist's primary function. Scanned images can be saved in PICT2 or compressed or uncompressed TIFF formats.

On Your Mark

The hardware—the scanner itself—is a SCSI device. That's not a problem, but the SCSI adapter box Caere provides is. First, the box has only one SCSI port, which means you can't daisy-chain other SCSI devices from it (without using a T adapter cable); second, it isn't internally terminated. The Typist's 300-dpi scanner, mean-

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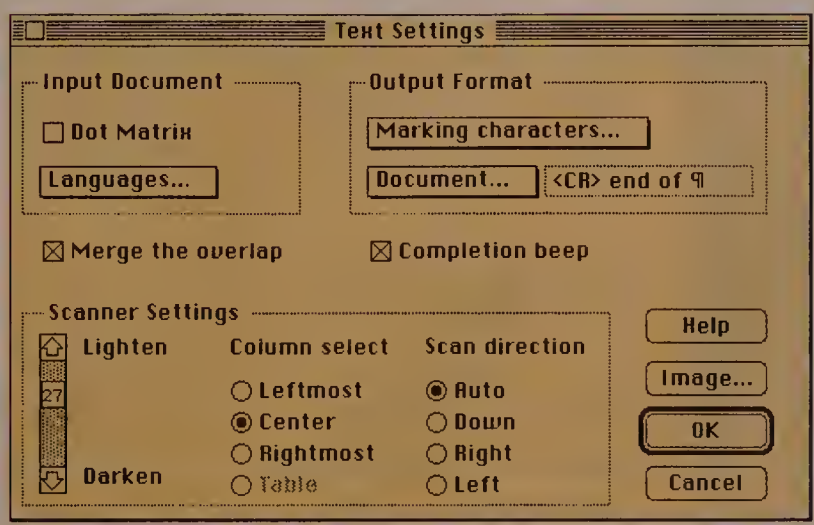

In Control The Typist DA allows you to flag unrecognizable or suspect characters, select the document's output format (spreadsheet, carriage returns after every line, or after every paragraph), and manually adjust scanner settings. Image scans are also performed within the DA.

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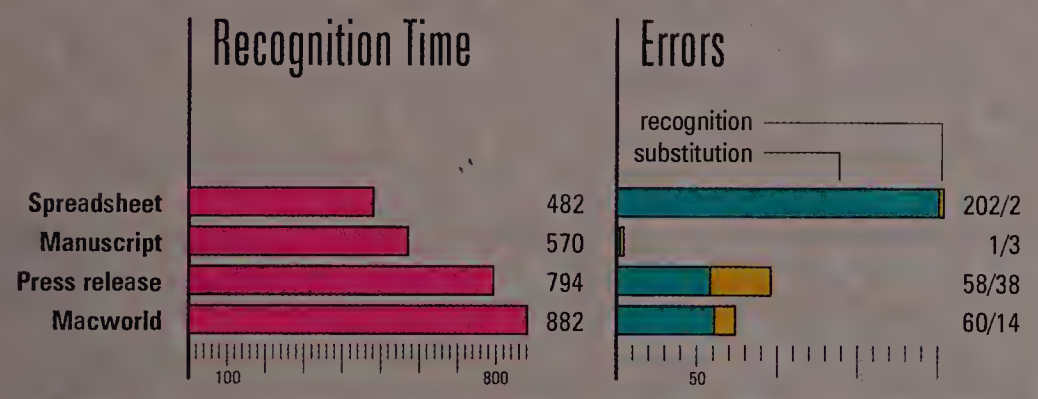
Circle 342 on reader service card



Typist was tested on the same four documents used in previous tests for OCR program benchmarks (see "Text without Typing," *Macworld*, October 1990). The spreadsheet was a 1-page, landscape-oriented, legal-size table of dates, printed on a LaserWriter in 10-point Times. The manuscript was a 10-page document printed on a LaserWriter in double-spaced, 12-point Courier. The 3-page Apple press release used a light condensed version of Garamond. And the *Macworld* test was a 6-page, 3-column feature article. Recognition time includes the time necessary to scan each page of a test document. Substitution errors are characters incorrectly recognized by Typist; recognition errors are characters not recognized by Typist.

while, features rubber rollers on the bottom to avoid skidding—a nice touch. A switch located on the scanner lets you adjust dithering for halftone image scans (dithering must be turned off for text recognition).

The software consists of a desk accessory and two INITs. Although the DA controls the Typist (see "In Control"), it's the INIT named tpapp—essentially Caere's OmniPage OCR engine—that makes the Typist what it is. Loaded at start-up time, tpapp lurks in the background of MultiFinder. When you scan text, the Typist moves the active application (the word processor, spreadsheet, and so on) to the background, and brings the OCR engine to the foreground. A character window and status bar appear so you can check the quality of the scan and monitor recognition progress. As soon as the engine finishes recognition, the application returns to the foreground so the Typist can insert the new text.

The Typist scanner has a scan width of 5 inches, so you need to make two passes to capture an entire 8½-by-11-inch page. You can scan down, right to left, or left to right. With horizontal scans, a *stitching* feature enables the Typist to automatically discard repeated text that appears in overlapping scans. On multicolumn documents, you can also set the Typist to read only the center, left, or right column.

Read All about It

I tested the Typist on a variety of documents—typeset, laser printed, and dot matrix—and was happy with its accuracy. It worked well on high-quality typeset text (from *Macworld* and *Newsweek)* and newspaper text (from the *Boston Globe* and the *National)*. It also performed surprisingly well on draft-mode dot matrix printouts. In fact, the Typist's accuracy closely matched that of other OCR programs (see "Text without Typing," October 1990). I had no compatibility problems with several applications, including MacWrite II, Word, Excel, and PageMaker.

The Typist is pleasantly tolerant of not-quite-perfectly-straight scans. But despite the Typist's horizontal scan capability, I found it difficult to get a clean scan from a thick book; the hand-held scan head just can't pass over a page as cleanly as a flatbed scanner can. Another thing that takes getting used to is positioning the scanner. It's hard to see where you started and stopped scanning.

As far as speed is concerned, the Typist cannot really compare to flatbed scanner OCR solutions. It is not the recognition process that makes the Typist slower, but scan time. The Typist is best suited to recognizing short- or medium-length sections of columnar documents. Use it on several full-length pages, and you'll start wishing for a flatbed scanner. For example, it took 15 Typist scans, compared with 6 flatbed scans, to recognize 6 pages from *Macworld.*

There are some important differences between the Typist and its OmniPage sibling. First, the Typist cannot automatically strip out the graphics in a text scan as OmniPage can. I found that the best solutions to this problem were either to make very short scans around the graphic or to cover the graphic with a piece of white paper during a scan. Second, the Typist does not automatically strip soft hyphens (those that split a word on two lines) from recognized text; you have to remove them yourself. Third, the Typist does not maintain text attributes—bold, italic, font size—in recognized text.

Too Good to Be True?

The Typist is definitely not perfect. By placing so much emphasis on OCR capabilities, Caere has neglected other not-so-trivial aspects. The most obvious omission is an on/off switch. You want to turn the Typist off—you disconnect it from the Mac SCSI port. If scanning text is easy with the Typist, scanning images is a chore—the image scan controls are incredibly poor. The manual, by no means information-packed in the first place, jumps between instructions for Mac and PC users, confusing matters further. Nor does the online help offer any more information than the manual.

Still, if you haven't seen the Typist, you should check it out. It's certainly the most convenient OCR method I've worked with, perfect for a short scan here, a short scan there. And there's nothing like the sight of the Mac automatically tabbing between spreadsheet cells and typing on its own—very quickly. Best of all, the performance the Typist offers matches that of flatbed scanner OCR solutions. That's something Caere should be proud of.—**Brita Meng**

See **Where to Buy** *or circle 780 on reader service card.*

Removable-Media Drives

BERNOULLI TRANSPORTABLE

Pros: Crash-resistant Bernoulli technology; swift file copying and data transfer; slim, lightweight cartridges; international power supply; switchable SCSI termination. **Cons:** Relatively heavy. **Company:** Iomega Corporation. **Requires:** Mac Plus. **List price:** $1399.

MICROTECH R50

Pros: Cartridge design excludes dust and dirt; bundled with Norton Utilities and Total Recall backup software. **Cons:** Moderately noisy during disk access; Finder-mediated file copy and data transfer more sluggish than Bernoulli or Syquest technologies. **Company:** Microtech International. **Requires:** Mac Plus. **List price:** $1299.

Removable drives that combine unlimited storage with high performance and easy transfer of large data files offer some real advantages over hard drives. Two new products, Microtech's R50 (developed by Ricoh) and Iomega's Bernoulli Transportable, are competing with the popular Syquest cartridge drives in the removable-drive market.

Both new removable drives come with a promise of high reliability, a welcome feature considering that the greatest problem I've had with my Syquest drive during three years is that the cartridges tend to develop bad blocks during extended use, which results in lost data and uncopyable files in many cases. And although it's difficult to accurately judge reliability, both new drives performed flawlessly throughout the course of my three-month evaluation.

Not Speed Demons

I tested the drives' speed against my Syquest drive using DiskBasher and DiskTimer. Both drives turned in benchmarks between 19 and 38 percent slower than the Syquest drive. But in general use I found the performance of the three drives to be approximately equal, with one notable exception. The Bernoulli Transportable was surprisingly swift at Finder-mediated file duplications and transfers—25 percent faster than the Syquest drive and 37 percent faster than Microtech's Ricoh drive. This is due, at least in part, to a 44K RAM cache that's transparently installed at start-up by Iomega's device driver.

Like Large Floppies

All three drives use removable cartridges whose plastic casings are almost the same size, but none of the cartridges are interchangeable between different drives. This can certainly be a deciding factor if you regularly need to send large data files to a service bureau or coworker. Unless you are using the same drive mechanism, removable cartridges won't be useful.

With its sliding shutter, the Bernoulli's cartridge resembles a floppy disk on steroids. It is the lightest and slimmest of all three cartridge formats, weighing only 5 ounces.

Ricoh versus Bernoulli

Although the Ricoh and Bernoulli cartridges both enclose a spinning disk of storage medium, their overall design philosophy is quite different. The disk inside the Bernoulli cartridge is flexible like the medium inside a floppy disk. When the Bernoulli's disk spins at high speed, it levitates and draws near the read-write head. If there is a physical shock, dust particle, or power loss, the disk simply falls away from the head. After the obstacle or disturbance has past, the disk literally flies back up. Iomega claims the system can endure up to 1000 g shocks during operation (a shock roughly equivalent to the drive's falling 8 feet).

Since this system is largely protected from dust and other airborne particles, Iomega makes the system relatively open to the air. The cartridge's shutter can be easily opened manually and you can even see into the interior of the cartridge when it's inserted.

The Ricoh cartridge in the Microtech drive contains a rigid disk much like the platter of a fixed hard drive. Because the read-write head hovers closely over the rapidly rotating disk whenever the cartridge is inserted, this type of system is far more vulnerable to dust and shocks, either of which might cause the head and the medium to crash into each other. Consequently, Ricoh cartridges are manufactured in a clean-room environment and are equipped with a shutter mechanism that makes it nearly impossible to accidentally open a cartridge and expose the medium to dust-laden air. This design feature and a modest 9 percent greater storage capacity are the primary distinguishing features between the Ricoh and Syquest technologies (the real-world capacities are 42.3MB for the Syquest and 46.3MB for the Ricoh).

Minor Complaints

The Ricoh drive has one quirk that users should take care to avoid: if you forget to eject the cartridge and you don't wait for the drive platter to stop spinning before you remove the disk, you can damage it. The Microtech manual carries a section in bold-face type warning of the danger, but it

(continues)

MARK JOHANN

The Microtech R50 (top), the Iomega Bernoulli Transportable (bottom)

Let NewGen satisfy your hunger for high-resolution with an affordable 800 dpi printer!

Text for the menu was created in PageMaker, saved as EPS files and placed in FreeHand.

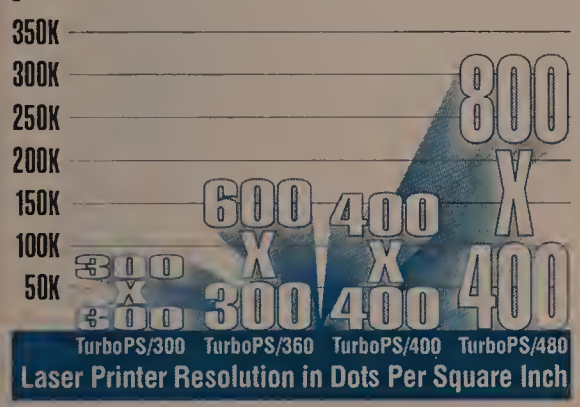
The Images with Impact® clip art illustrations were edited with FreeHand and color was specified in cyan, yellow, magenta and black.

The Apollo logo was created in FreeHand where the various elements were edited and combined.

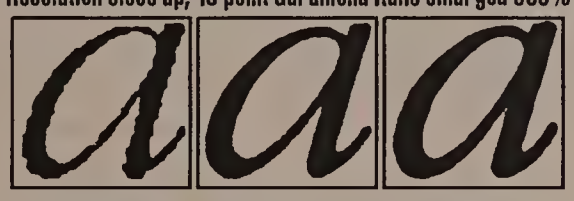
Add powerful applications like PageMaker®, FreeHand® and Adobe® Type Fonts to produce typeset quality output at your own facility.

The NewGen TurboPS/480 can produce PostScript® language compatible output at 800 x 400 dpi, nearly four times the resolution of other laser printers. And when we say PostScript compatible, we mean it, including Type 1 fonts, special effects and EPS files from all your favorite applications and programs.

The NewGen TurboPS/480 is a complete printer with built-in AppleTalk®, parallel and serial ports. And unlike some printers, it works in mixed Mac-PC environments, and it doesn't require an internal PC processing board or dedicated server.



Resolution close up, 18 point Garamond Italic enlarged 500%



300 x 300 dpi LaserWriter II	800 x 400 dpi NewGen PS/480	600 x 600 dpi Varityper VT-600

To show you how confident we are that you'll be impressed with 800 x 400 dpi output, we printed this page at actual size, including the menu which was output as color separations.

What does all this resolution and compatibility cost? Very little. The TurboPS/480 – with 800 x 400 dpi and RISC performance – lists for about 25% to 50% less than its competitors, while our TurboPS/400, TurboPS/360 and TurboPS/300 laser printers cost less than slower 300 and 400 dpi PostScript language printers.

If you have an appetite for high-speed, high-resolution PostScript language printing, call 714/641-8900 today to get your TurboPS evaluation kit.

Dealer inquiries welcome.

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Dealers Circle 244 on Reader Service Card **End Users Circle 246 on Reader Service Card**

seems to me that a cautionary statement should be printed on the drive itself (perhaps on removable tape).

The most unappealing aspect of the Bernoulli Transportable is the fact that it needs to be cleaned occasionally in order to remove accumulated dust and grime that might otherwise cause frictional wear on the read-write head and medium surface. A cleaning cartridge and cleaning fluid is supplied with the drive. Bernoulli claims a mean-time-between-failures rate of 60,000 hours for a drive that is cleaned every month, a very respectable indication of overall reliability.

Not Quite Transportable

You'll hesitate before carrying the 12-pound Bernoulli Transportable to and from work. But the unit is enclosed in a sturdy metal case designed to take hard knocks during transport, and the carrying handle that swings out from the front of the drive makes it easy to carry. The Bernoulli also comes with external switches to change the SCSI address, turn termination on or off, and switch between 115v and 230v operation, a handy feature for overseas travel. Another advantage of the Bernoulli system is that with the optional software (available from Iomega), the drive works with any MS-DOS computer equipped with a SCSI port. And with an additional program called Bernoulli File Exchange, Mac and MS-DOS users can exchange files too large to be transferred from one system to another on floppy disks.

Toll-Free Technical Support

Both drives come with toll-free technical support, a noteworthy feature that more drive manufacturers should offer. Iomega's Bernoulli Transportable comes with a one-year warranty that's extendable to two years for an extra $75. The Microtech R50 comes with a two-year warranty and a promise to send you a new drive within 48 hours if yours should fail. Iomega will provide a new drive the very next working day for a $50 charge.

Making the Choice

Both the Iomega Bernoulli Transportable and the Microtech R50 are solid products that provide high-performance removable storage at nearly equal cost. If you expect to be using a removable-cartridge drive for everyday use as your principal hard drive or for storing data, either of these drives is probably a better choice than a Syquest drive, based on my experience. If you need a sturdy, transportable drive that's relatively insensitive to hard knocks, the Bernoulli Transportable deserves a close look. But if what you're looking for is the ability to quickly back up a hard drive, or easily send large files, Syquest drives can do the same job as either of these drives at nearly half the cost.—**David L. Foster**

See Where to Buy or circle 621 (Bernoulli Transportable), 696 (Microtech R50) on reader service card.

Chooser Plotter-Device Driver

PLOTTERGEIST 1.0

Pros: Cable supplied; renders LaserWriter fonts. **Cons:** Does not work with all software packages; font rendering takes a long time. **Company:** Palomar Software. **Requires:** Mac Plus. **List price:** $395.

Output from computer-aided design (CAD) systems has always presented unique problems because most CAD drawings are larger than 8½ by 11 inches. Printers that can handle larger sizes tend to be either very expensive or have unacceptable dot matrix output. Plotters offer high-quality color drawings on relatively inexpensive hardware. Palomar Software has released Plottergeist 1.0, a plotter driver that rivals Microspot's MacPlot.

Plug and Configure

Connecting a plotter to the Macintosh is not quite as simple as plugging in the cable and choosing Print from the File menu. Some knowledge of baud rate, stop bits, parity, and handshaking helps tremendously in setting up the connection. Palomar supplies Choose software and a cable that works with most plotters. Selecting page setup in your CAD program enables you to select pen speeds and colors, as well as chord tolerance for the smoothness of curves.

Text quality is an important issue. I am accustomed to the precise vector-based fonts that are standard with high-end CAD packages such as AutoCAD and MacBravo. Packages such as Claris CAD and MacDraw II use the basic Apple LaserWriter fonts and therefore Plottergeist must follow suit. In order to obtain acceptable text output from the plotter, Plottergeist renders these fonts for each particular point size. Once rendered, the result is stored in a file, thereby making future plots using the same font and point size much faster. Although its output is exceptional, Plottergeist's rendering time is extremely long. You can plan on at least one to two days' rendering time for each font. You can select Rough Draft from the Page Setup dialog box to produce quick output, but you compromise text quality.

Performance

I used a Hewlett-Packard Draftmaster I and a Mac IIx with 8MB of RAM and an 80MB hard drive to generate plots from Claris CAD, MacDraw II, Blueprint, and MiniCad 3.0. AutoCAD Release 10, Douglas CAD/CAM, Douglas Schematic, MacBravo Modeler, and DynaPerspective did not function with Plottergeist. (According to the company, Plottergeist version 1.1 will be able to work with AutoCAD and DynaPerspective, but it was not available at press time.) Also, after converting my Mac IIx to a IIfx with 16MB of RAM, I needed a software serial-switch patch, available from Apple or Palomar, to run Plottergeist through the serial port.

Overall, Plottergeist works as well as Microspot's MacPlot Chooser driver, which is supplied in its simplest form with MacDraw II, MacProject II, and Claris CAD. The engine is also used in IDD's Dreams with a minor interface change. The decision to spend a substantial sum of money for Plottergeist 1.0 depends on whether you need background plotting capabilities and LaserWriter fonts. If you output a lot of engineering drawings and graphic art, Plottergeist is a good buy. If, however, you only occasionally produce engineering drawings, Plottergeist is probably too expensive.—**Victor Elgohary**

See Where to Buy or circle 722 on reader service card.

There's more to comparing LaserJet PostScript® Language Emulation Cartridges than just the name

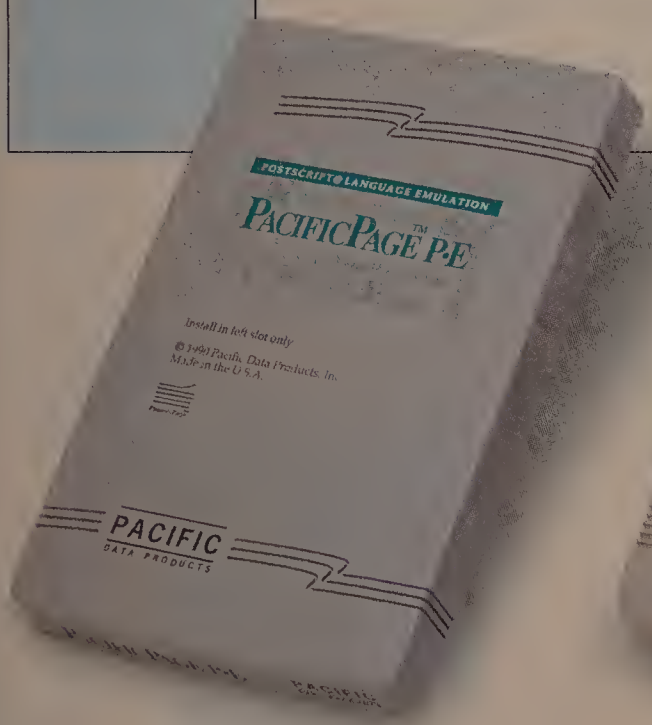
	Pacific Data Products PacificPage P•E™ for Macintosh®	Hewlett-Packard PostScript® Cartridge
Price	$699	$695
AppleTalk® interface	Included	$275
2 MB printer memory	$299	$560
Additional font cartridge option	Yes	No
Upgrade program	Yes	No
Warranty	Lifetime	One Year

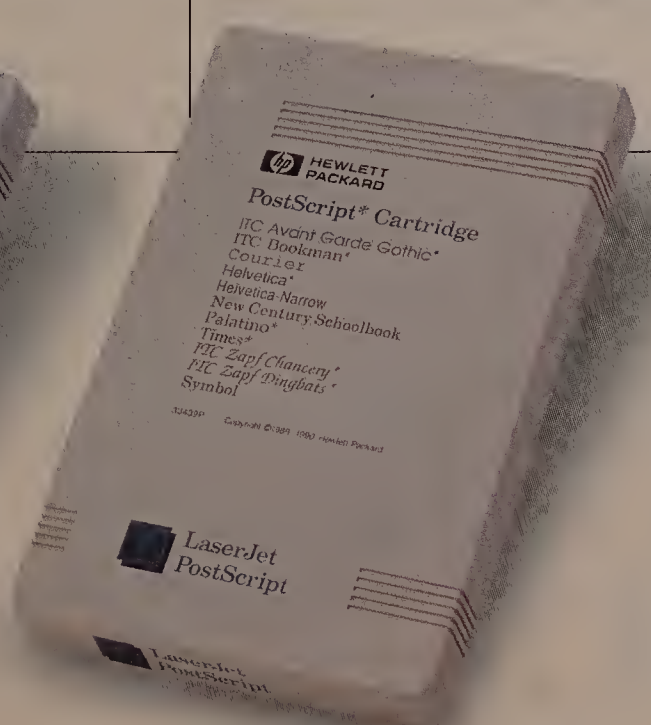
Don't settle for less just to buy the HP name. Ask for Pacific Data Products' **PacificPage P•E**. It's the PostScript language emulation cartridge for HP LaserJet IIP, IID, III and IIID printers that offers you more for less.

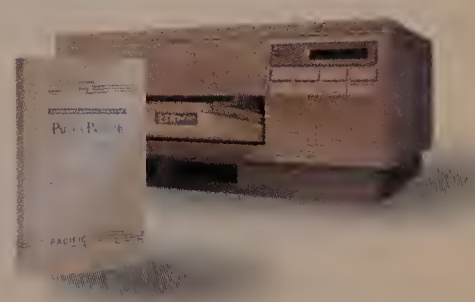
Compare the price. PacificPage P•E with the PacificTalk interface module costs only four dollars more than the HP cartridge alone. That's like getting the AppleTalk free!

And compare its lifetime warranty, upgrade program for keeping current with the latest version, and the powerful optional companion cartridge, PacificType.

To learn how you can get more for less, call your nearest dealer or contact: Pacific Data Products, 9125 Rehco Road, San Diego, CA 92121, **(619) 597-4633**, Fax (619) 552-0889.





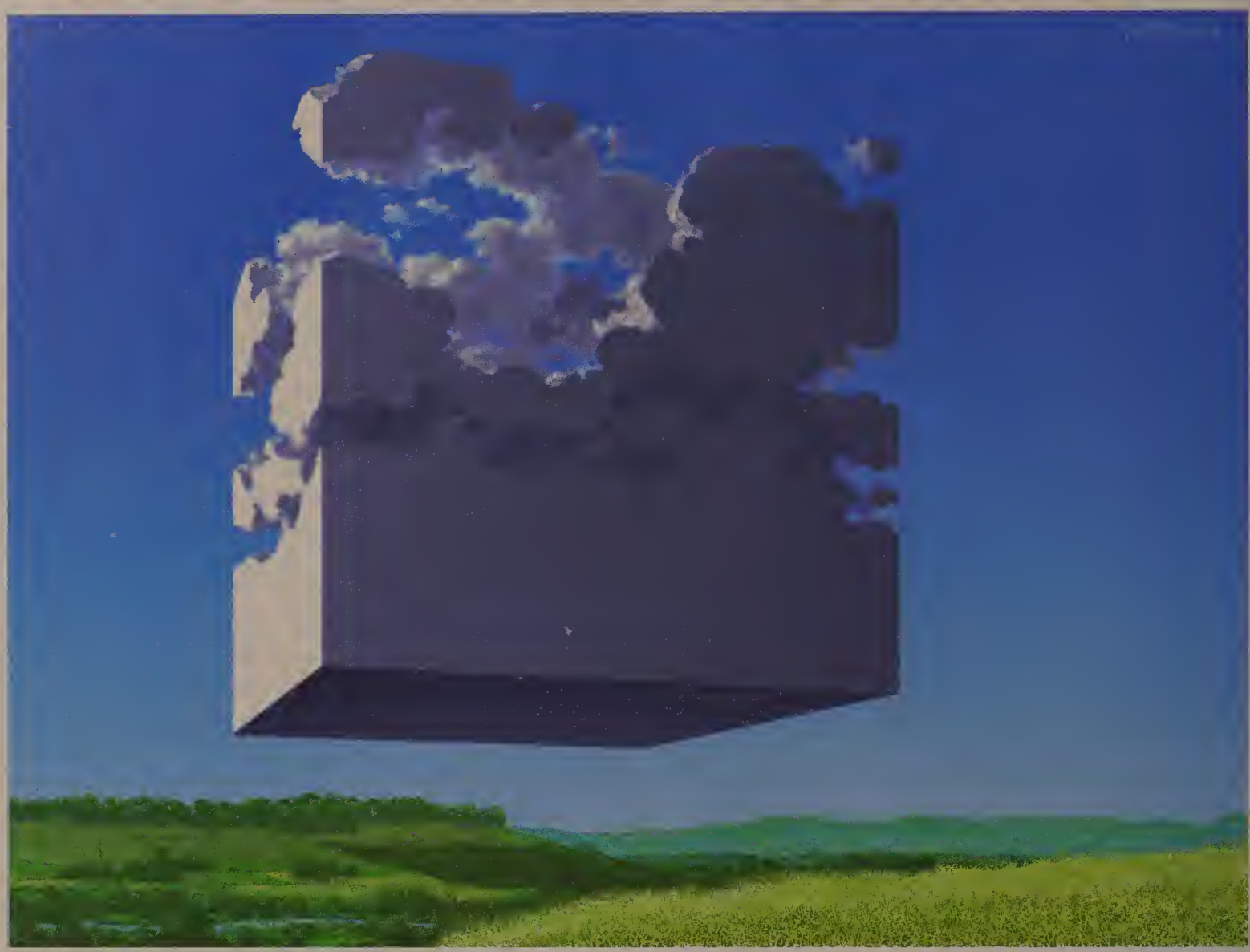


PACIFIC
DATA PRODUCTS

This cartridge is compatible with the HP LaserJet models IIP, IID, III and IIID. Prices are suggested retail list price. PacificPage P•E, PacificTalk and PacificType are trademarks of Pacific Data Products, Inc. PhoenixPage is a registered trademark of Phoenix Technologies Ltd. Copyright 1987, 1988 Phoenix Technologies Ltd. Macintosh and AppleTalk are registered trademarks of Apple Computer, Inc. PostScript is a registered trademark of Adobe Systems Inc. © 1990 Pacific Data Products, Inc.

PhoenixPage

Second Nature.



"Skybox" by Ron Cobb placed first in SuperMac's 2nd annual PixelPaint Professional art contest.

Image created entirely in PixelPaint Professional.

Introducing PixelPaint Professional® 2.0.

The folks who made it easy for you to create your own world with PixelPaint Professional now give you a second chance to improve nature's handiwork—with PixelPaint Professional 2.0, new from SuperMac.™

PixelPaint Professional 2.0 lets you design and create your own stunning, photorealistic, 32-bit color images using the paint tools you already know and love. Plus some fantastic new advanced features you're sure to enjoy.

Features like multiple document support, for up to 8 different images on screen simultaneously. Higher pixel resolutions for massive images up to 4K by 4K in size. Wet paint and pressure sensitive tools for superior placement and stroke control. Plus sophisticated 8-bit masking for complex designs and illustrations.

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Circle 166 on reader service card

WINDOW SHOPPING

by Lawrence Stevens

Among the products I review this month are a boxed collection of shareware, an INIT that provides a better way to open files in applications, and an astrology program.

The Macintosh Bible Software Disks, Third Edition

The Macintosh Bible Software Disks, Third Edition ($38 from Goldstein & Blair) has placed over 20 of the best shareware and freeware programs on a two-disk set. You try the programs, choose the ones you like, and send a check ranging from $5 to $15 to the software developer.

Many of these programs can be combined to substitute for full-blown applications. For example, between Calendar 2.1 and To Do 1.0 and SuperClock 3.9, you have most of the functions of a calendar program that could cost over $100.

Others are cost-effective alternatives. Blackout 1.21 might not have all the features of a commercial screen saver, but it only costs $5, and it does the job of darkening the screen when the Mac is not in use. And if you don't want to spend over $100 for a commercial communications package to access electronic bulletin boards, FreeTerm 3.0 does a fully creditable job, and it's entirely free.

KiwiFinder Extender 1.02

KiwiFinder Extender ($99.95 from Kiwi Software) eliminates virtually all the problems in the Open dialog box, provides a file-finding feature that is better than Apple's Find File desk accessory, and includes a Search feature.

When KiwiFinder Extender, an INIT, is installed, the files in the Open dialog box in any application can be viewed by Name, Type, Creator, Create Date, Modified Date, or Keywords. To let you view all your files, the Open dialog box ignores the Finder's hierarchy of files and folders. For example, when you view by Name, the Open dialog box displays 26 virtual folders in alphabetical order. If you click on the B folder, you view all the files beginning with B even if, in actuality, these files are scattered in dozens of folders throughout the Finder.

RON CHAN

As we buy larger disk drives, organizing the numerous files and folders on them becomes more and more difficult. KiwiFinder can help.

Astrix 1.0

The brochure for Astrix ($69 from Microseeds Publishing) asserts that it "foretells the future and casts horoscopes which are truly insightful and always fun." Being basically a nonbeliever, I will leave it to others to decide whether the horoscopes cast by Astrix are insightful. For every planetary position, Astrix displays one stock phrase.

For example, each of my daily horoscopes for over a year contains the phrase: "Pluto transiting the Second House marks a time when you must be judicious in personal decisions about finances."

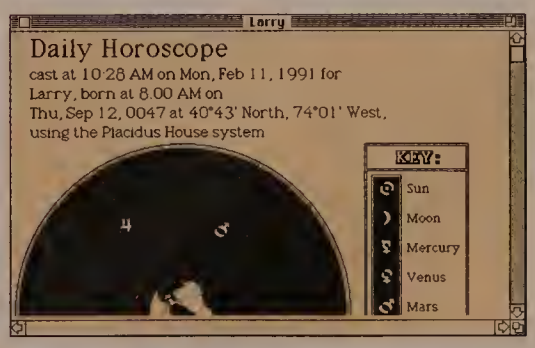
Astrix does all the math and drawing work necessary to cast a natal or daily horoscope chart, and you can choose from the three major house systems astrologers use today. The manual has a concise glossary of astrological concepts and terms, and the program comes with birth information on 18 famous and infamous people for practice. But if, as I do, you find astrology to be a trivial diversion, stick to the newspaper columns.

MacSleuth 1.0

My first thought after opening MacSleuth ($149 from Dariana Technology Group) was, Who needs it? The program provides reports, on screen or hard copy, of the software and hardware attached to your system and Mac. It lists desk accessories, INITs, cdevs, drives, type of processor, modem and printer port peripherals, amount of installed memory, and so on.

The thing is, I already know most of that stuff. I'm well aware of the peripherals connected to my Mac. If I forget which cdevs I have installed, all I have to do is access the information from the Apple menu; and while I have to admit I didn't know my video scan

(continues)



Electronic Horoscope Astrix eliminates the need to use a calculator and drawing tools to cast a horoscope. You type in the birth date, time, and place, and the program draws the chart and provides a report that interprets the chart.

rate was 60.15Hz, I can't see that not knowing affected my life much.

My guess is that 90 percent of *Macworld* readers know as much or more about their hardware and system as I do. But there are thousands of Mac users who don't read computer magazines. A consultant set up their machine with the necessary hardware and software, taught them to use a few applications, and left. When this user gets into trouble, and has to telephone for support, MacSleuth can provide ready answers to the tech rep's questions.

By reading MacSleuth data over the phone, mailing a hard copy, or sending the screens over a network, you can limit the need for on-site support and save yourself a bundle.

Word Count DA 1.2

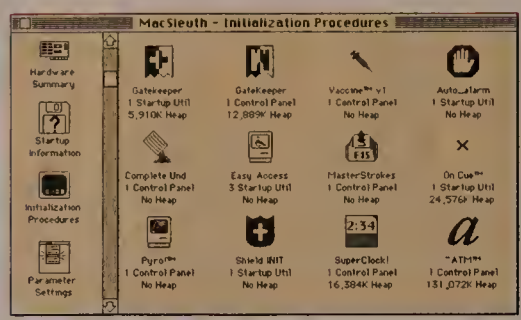
Virtually all the newest versions of word processor applications have word count functions. But if you're still using an older version of a word processor, such as Microsoft Word 3.0, Word Count DA ($19 from Intelligence Active Software) can complement your system.

Besides counting words, paragraphs, and sentences, Word Count DA also counts the number of words longer then 2 syllables and calculates typographical words (number of characters divided by 5). Personally, I'd prefer that it just count the number of characters and leave the dividing to me, but that's a quibble.

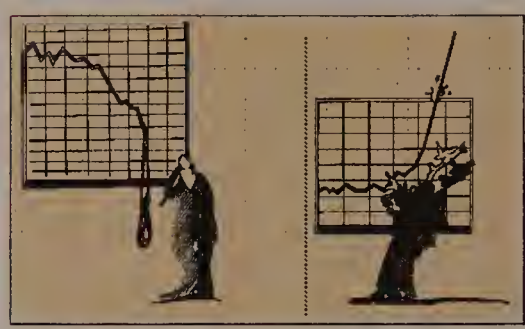
Word Count DA does have one unique feature; it measures the reading difficulty of a document by calculating the ratio of sentence length to number of difficult words (words with 3 or more syllables). The result is supposed to represent the grade level of the writing from third grade to professional. If you write sixth-grade text books, this feature might help you. But for the rest of us, it's pretty useless.

Cataloger 1.01

I have to admit to being a pack rat of the worst kind: a disorganized one. I have hundreds of applications and documents scattered throughout 200 or 300 disks. The problem is that few of these disks are labeled accurately. So to find a particular file, I must remember which disk I placed it on.



Learning about Your System By clicking on the icons on the left side of this MacSleuth screen, you specify the information you want to see. To get the above screen, I selected Initialization Procedures, which displayed the INITs on my system.



Witty Business Images Two examples of FM Waves Business Images. The left is entitled "Bad Forecast"; the right is entitled "Good Forecast."

Now, after receiving Cataloger ($39 plus $1 postage from Masters Publishing) and cataloging all my disks, I'm almost completely organized. The program displays a screen with each floppy disk represented by the standard Finder floppy disk icon. I can view—by Icon, Small Icon, Name, Date, or Size—the names of all the files on any disk. The program can also search for a particular file. This is a great organizer, at a much lower price than similar products I've seen. So if you have a large floppy-disk library, I highly recommend Cataloger.

TrackMate 1.0

TrackMate ($34.95 from TrackMate America) combines floppy-drive diagnostic software (that determines head condition and rotational speed) along with a cleaning system. The software also keeps track of each cleaning, and provides cleaning reports.

The most important part of the system is the cleaning disk, which contains a rotating fabric disk to which you apply solvent. The cleaning disk is better than others I have seen. The fabric has more texture and is exposed not only in the read-write section (front) of the disk, but also along the sides; so it cleans the loading rails as well as the read-write head.

I've used TrackMate in about ten disk drives, including those in three 5-year-old Mac Pluses. In two of those three Pluses, the cleaning disk did not eject entirely. I didn't have this problem with newer Mac Pluses or with Mac SEs. The company says the problem occurs in a minority of older drives, which sometimes are not aligned properly. If you have a newer machine, you have nothing to worry about.

Quality Artware

Quality Artware ($144 per module from FM Waves) consists of seven modules of contemporary, humorous clip art (with a program that allows you to convert the images to PICT or TIFF files). The modules I looked at include Fashion, Glamour, Fantasy, Animals, Agenda for the Nineties, and Business Images. There are about 100 images per module, and they differ from the run-of-the-mill artwork you normally see in clip art collections. Many of the collection's images aren't suitable for standard office use but it just might wake up sleepy newsletters or office memos.

Keyboard Shelf

Kensington Microware is known for its ingenious and sturdy Mac accessories. Its newest product, Keyboard Shelf ($59.95), is a stand that elevates a Mac Plus or SE series so that a shelf becomes available under the Mac to store the keyboard. In terms of design and construction, this product fits in with Kensington's reputation for excellence. But its main purpose—to save valuable desk space—only happens when the keyboard is not in use and can be tucked away.

This device also raises the Mac for better viewing and provides a small recess under the keyboard area to hold a couple of floppies or paper clips. If your Mac is often sitting unused, and you can utilize the space in front of it for paperwork, buy this. It looks great, and it can eliminate some clutter on your desk. ■

See Where to Buy or circle 618 (Astrix), 624 (Cataloger), 674 (Keyboard Shelf), 675 (Kiwi-Finder Extender), 683 (The Macintosh Bible Software Disks), 689 (MacSleuth), 738 (Quality Artware), 774 (TrackMate), 788 (Word Count DA) on reader service card.

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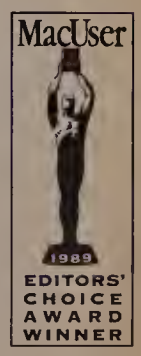

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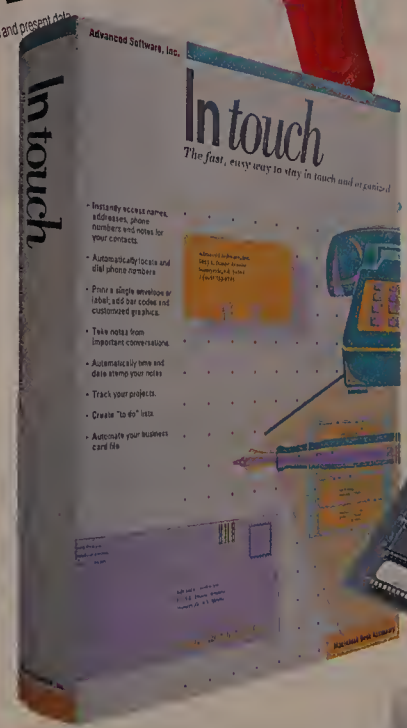

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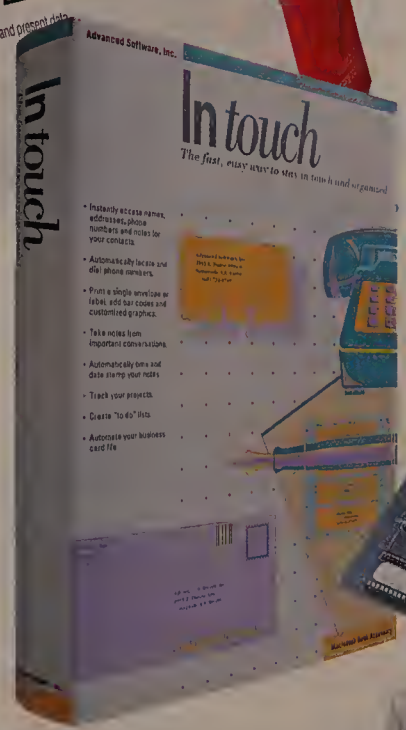

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Synex
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Systems Compatibility Corp.
Software Bridge ..... 82.
T/Maker
WriteNow 2.2 ..... 119.
Teleware
M.Y.O.B. ..... 143.
Timeslips Corporation
TimeSlips III ..... 188.
TimeWorks
Hyperworks Organizer ..... 56.
Tops/Sitka
Network Bundle DOS 5.25" ..... 169.
Tops 3.0 Network Bundle ..... 186.
Traveling Software
Lap-Link Mac Network Pac ..... 185.
Lap-Link Mac Connect. Pac ..... 94.
WordPerfect Corp.
WordPerfect ..... 226.
Zedcor Inc
Desk ..... 219.

GRAPHICS

3G Graphics
Images W/Impact
Business 1 ..... 63.
Graphics & Symbol ..... 49.
Accents ..... 65.
Adobe
ATM Plus Pack ..... 107.
Collector's Edition II ..... 128.
Collectors Editions I ..... 78.
Illustrator 3.0 w/ATM 2.0 ..... 345.
Photoshop ..... 495.
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PubPak 3: Presentations ..... 275.
Smart Art 1-4 ..... 83.ea
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Type Set 1 or 2 ..... 57.
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Freehand 2.02 ..... 325.
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Broderbund
TypeStyler 1.5 ..... 114.
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Claris CAD ..... 598.
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Vol 1-9 ..... 39.
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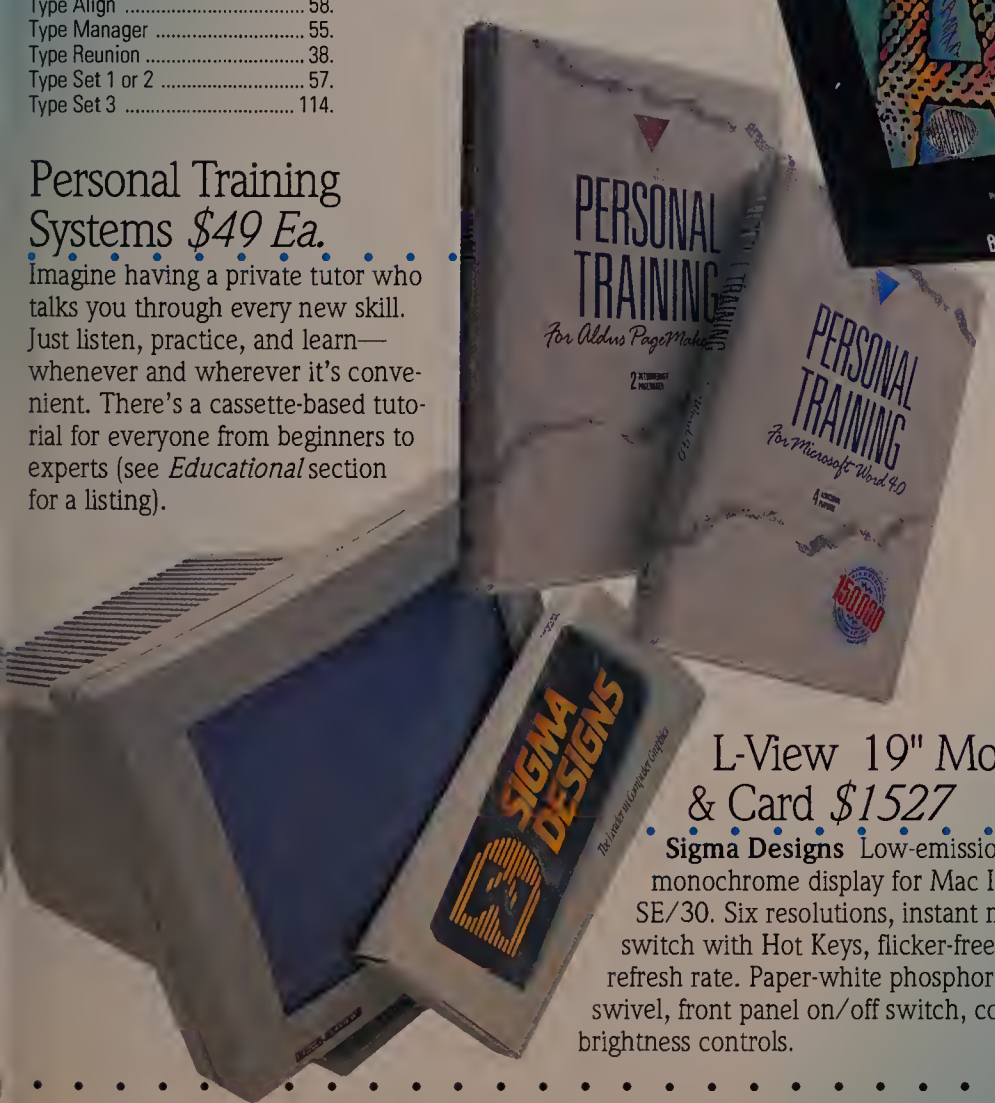

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Classic Art CD ROM Bus Vol. ..... 374.
Innovative Data Design
Dreams ..... 319.
MacDraft 2 ..... 189.
Letraset
Imagestudio ..... 149.
MacroMind
MacroMind Director ..... 436.
Marketing Graphics Inc.
Clips
Holidays ..... 49.
PagePak
LAN Pak, 10 Users ..... 219.
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Fast Pitch ..... 119.
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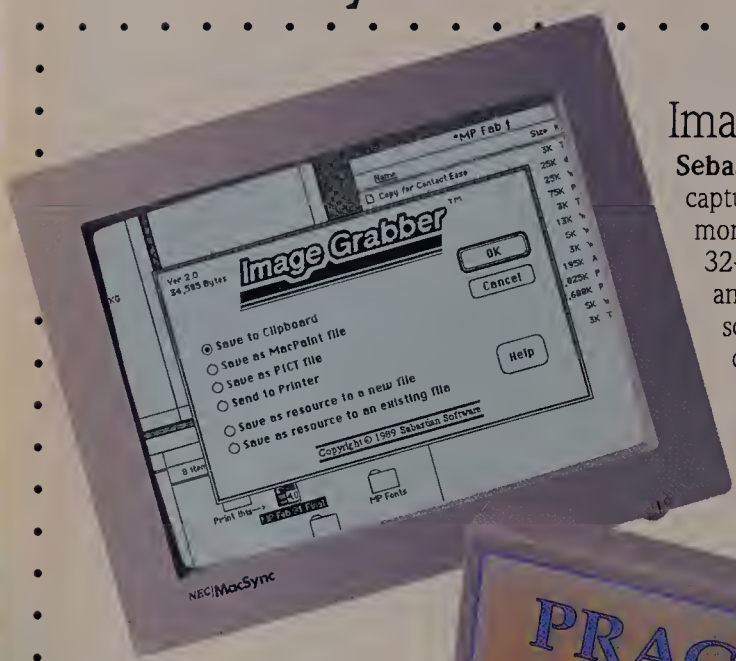

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Deskpaint/Deskdraw 3 ..... 114.

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Galaxy Universal Librarian ..... 168.
MIDI Play ..... 45.
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Studio + Two MIDI Interface ..... 165.
Studio 3 Midi/Smpte Interface . 268.
TimeCode Machine Smpte Inter 145.
Vision ..... 338.
Passport Designs
Audio Trax ..... 117.
DeskTop Music Creat. Kit CD .... 165.
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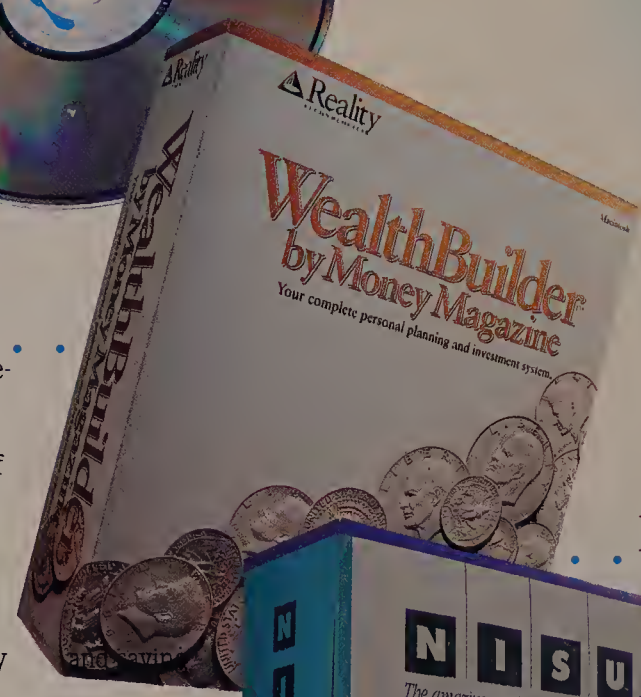

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- Programmers Online Companion 32.
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- Vol.1 ..... 18.
- Vol.2 ..... 19.
- Vol.3 ..... 17.
- Vol.4 ..... 19.
- Vol.5 ..... 21.
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Bantam Books
- Hypercard Handbook 2.0 ..... 22.

Digitalk
- Smalltalk/Vmac V1.1 ..... 124.

ICOM Simulations
- HyperTMON ..... 57.
- TMON ..... 86.

Microsoft
- Quick Basic Ver 1.0 ..... 64.

Microsoft Press
- Inside SuperCard 1.5 ..... 17.

Silicon Beach Software
- Super Card 1.5 ..... 185.

Somak
- Script Edit 2.0 ..... 62.

Symantec
- Just Enough Pascal ..... 52.
- Think C 4.0 ..... 160.
- Lightspeed Pascal 3.0 ..... 159.

TGS Systems
- Prograph ..... 239.

Zedcor Inc
- ZBasic 5.0 ..... 114.

UTILITIES

Advanced Software
- Intouch ..... 39.

Aladdin Systems
- Stuffit Deluxe 1 ..... 59.

Alsoft
- Diskexpress II ..... 52.

ASD Software Inc.
- FileGuard 2.5 ..... 128.
- FileGuard 2.5 (10-User) ..... 575.
- FileGuard 2.5 (5-User) ..... 349.

Baseline Publishing
- 1 Shot Worksheet ..... 59.
- APB Express ..... 59.
- INIT Manager ..... 34.

Beagle Brothers Software
- Flash ..... 119.

Berkeley System Design
- After Dark 2.0 ..... 20.

CE Software
- Alarming Events ..... 85.
- Calendarmaker 3.0 ..... 32.
- Disktop 4.0 + Gofer & Util ..... 63.
- Mockpackage Plus 4.4 ..... 31.
- QuicKeys 2.0 ..... 93.

Central Point Software
- Copy II Mac ..... 21.
- Mac Tools Deluxe ..... 75.

Dantz Development
- Retrospect ..... 148.

Dayna Communications
- Dos Mounter ..... 53.

Dubl-Click Software
- Calculator Con Set 2.0 ..... 45.
- ClickChange ..... 40.

Farallon
- LIAISON V3.0 ..... 265.

Fifth Generation
- Fast Back II ..... 118.
- Pyro! 4.0 ..... 25.
- Suitcase II ..... 49.
- Superspool 5.0 ..... 57.

Mainstay
- Capture ..... 42.

Masters Publishing
- Cataloger ..... 28.

Microcom
- 911 Utilities ..... 89.
- Carbon Copy Mac ..... 117.
- Carbon Copy Mac TwinPak ..... 152.
- Complete Undelete ..... Call.
- Virex ..... 55.

Microseeds
- Init Picker 2.0 ..... 35.
- Redux ..... 48.

Now Software
- Now Utilities V 2.0 ..... 69.

ON Technology
- On Location ..... 72.

Psybron Systems
- CalenDAr ..... 25.

Sabastian Software
- Image Grabber 2.0 ..... 33.

Salient
- Disk Doubler ..... 45.
- Partner ..... 55.

Software Innovations
- HandOff II ..... 49.

Somak
- SharpenUp ..... 59.

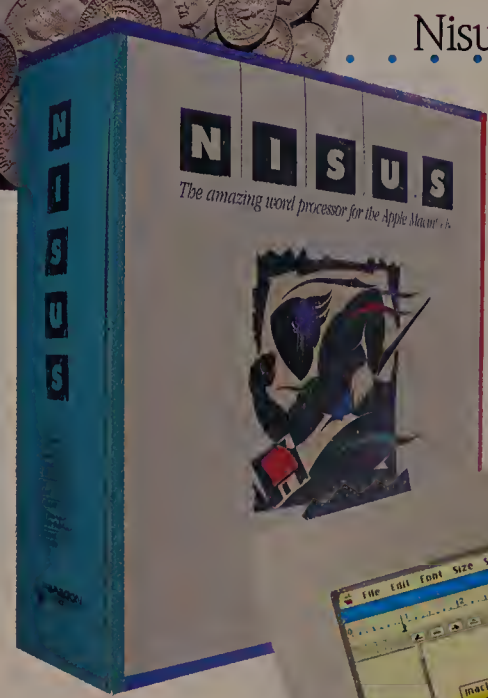
SuperMac Software
- SuperLaserSpool 1-5 Users ..... 289.
- SuperLaserSpool 2.0 ..... 84.

Symantec
- Norton Utilities for the Mac ..... 85.
- S.A.M. ..... 57.
- S.U.M. II ..... 99.

Vertical Solutions
- FastCat ..... 51.
- FastEnvelope DA ..... 45.
- FastLabel ..... 45.
- Laser Fast Labels ..... CAll

ENTERTAINMENT

Accolade
- Test Drive II The Duel ..... 31.



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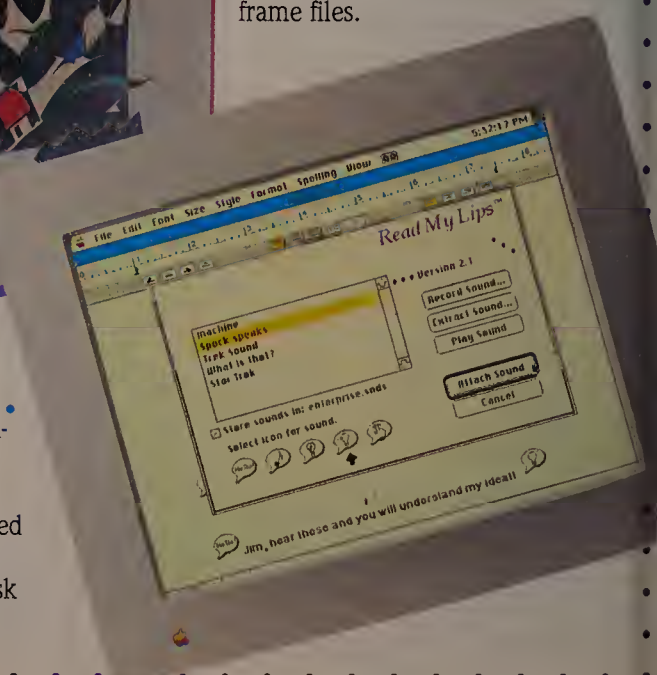

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SimCity Supreme ..... 47.
The Playroom ..... 29.
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Crystal Ouest 2.2 ..... 27.
Crystal Ouest & Critter Ed. ..... 48.
Mission Starlight ..... 29.
Sky Shadow ..... 29.
Centron
Casino Master B & W ..... 38.
Casino Master Deluxe Color ..... 48.
Delta Tao Software
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Lottery Tracker & Wheeler ..... 24.
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Bomber (w/Headphones) ..... 32.
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Lucasfilm
Indiana Jones/Last Crusade ..... 34.
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Cribbage King/Gin King ..... 28.
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Strategic Simulations, Inc.
AD&D: Curse of the Azure Bonds 34.
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Strategic Studies Group
American Civil War Vol 2 ..... 28.
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Halls Of Montezuma ..... 28.
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Armor Alley ..... 34.
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Sands Of Fire ..... 32.
Toyogo, Inc.
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XOR Corporation
Bermuda Square ..... 19.
Lunar Rescue ..... 32.
MacCourses ..... 19.
MacGolf Classic ..... 52.
MacSki ..... 38.
NFL Challenge ..... 53.
Road Racer ..... 38.
TaskMaker ..... 26.

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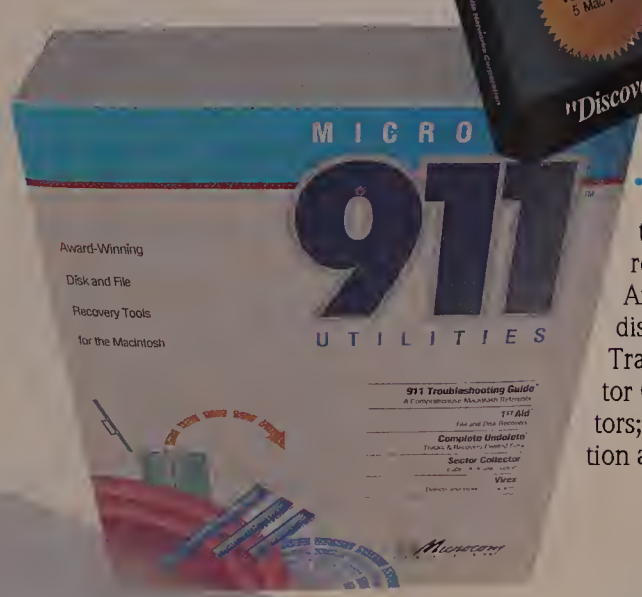

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Kidsmath ..... 26.
Kidstime ..... 26.
Number Maze ..... 26.
HyperGlot Software
Japanese - KanjiMaster ..... 98.
Learning To Speak French-CD ... 174.

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Writing Tutor ..... 41.
Pronunciation Tutor
Span.,Fr.,Ger.,Chinese ..... 34.
Russian
Beg. Intro ..... 28.
Noun Tutor w/sound ..... 58.
Survival Manual ..... 41.
Tense Tutor
Span.,Fr.,Ger.,Itl ..... 41.
Verbal Tutor/Aspect
Span.,Fr.,Ger.,Russ ..... 41.
Word Torture 3.0
Russ.,Span., Fr., Ger., Itl. ..... 28.
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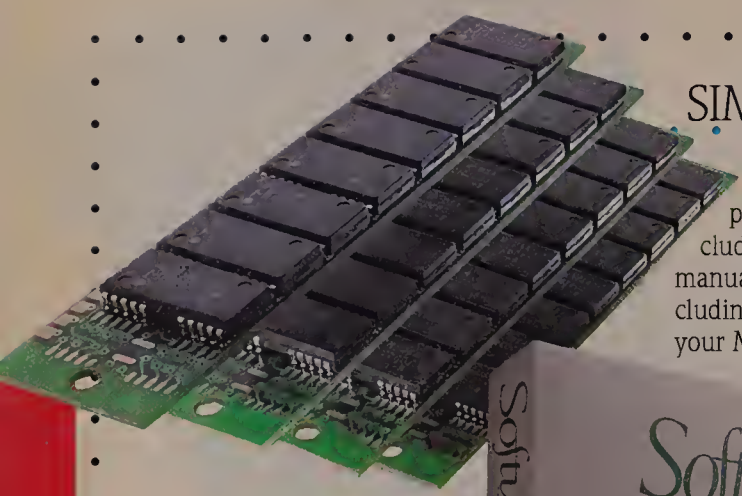

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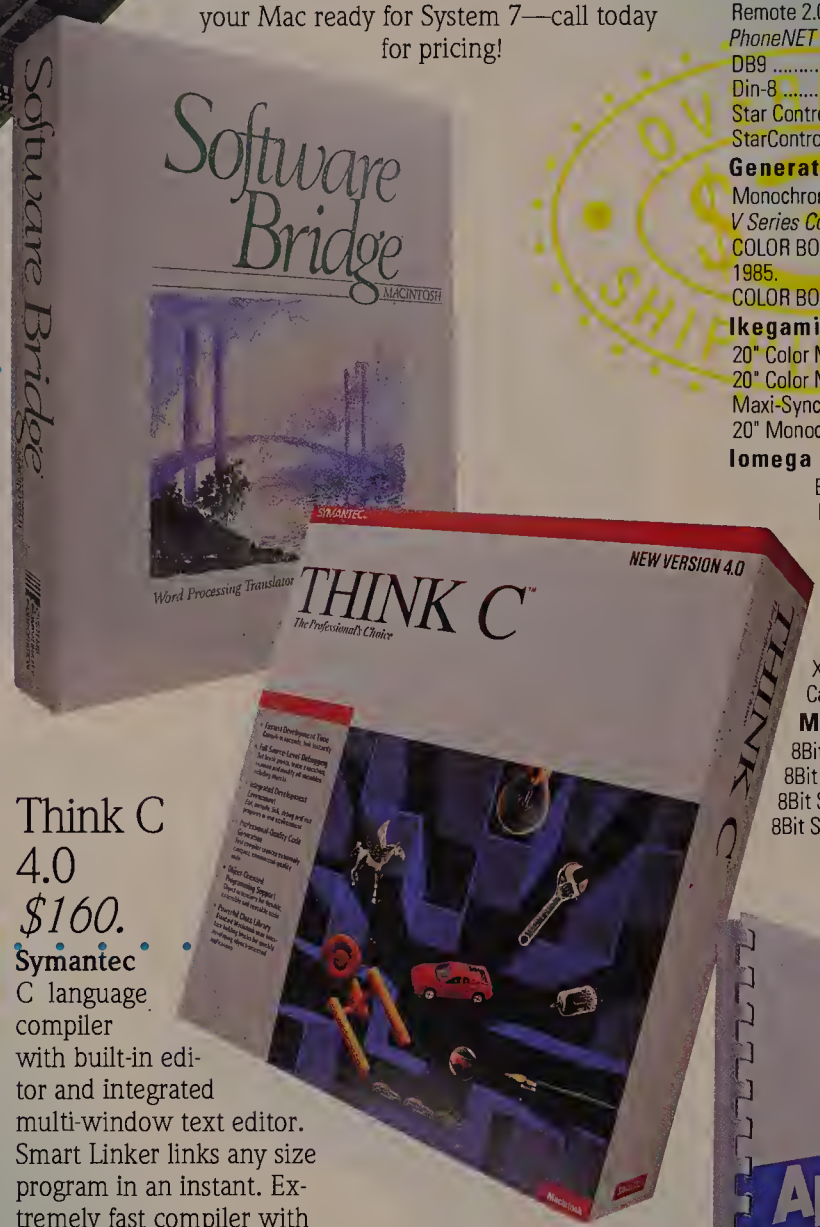

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DataLink/Mac (Internal 2400) ... 206.
QuadraLink ..... 164.
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GatorShare Software ..... 1389.
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SwitchBall ..... 119.
Switchboard ..... 169.
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Marathon
68030 for Mac II ..... 439.
68030 for Plus ..... 445.
68030 for SE ..... 435.
68030 MultiComm ..... 315.
Racer ..... 148.
68030 Parallel/Serial ..... 189.

Everex
Emac 60T (Tape Backup) ..... 639.
EMAC DAT 1.3 Gig Tape Back 2796.
EMAC 150MB Tape Backup ..... 898.
MD2400 Baud Modem MNP-5 . 169.
Farallon
Media Tracks Multimedia Pack 319.
Media Tracks Multimedia Pack CD 319.
Media Tracks ..... 189.
Remote 2.0/9600V32 Mod Pack 839.
PhoneNET
DB9 ..... 31.
Din-8 ..... 31.
Star Controller ..... 819.
StarController-EN ..... 1589.
Generation Systems
Monochrome Board 19" Mac II . 239.
V Series Color Boards
COLOR BOARD 24 BIT 19" MAC II 1985.
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Micron Video Cards
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8Bit MacII - 13"/14" Mon 298.
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NAC
Hyper-Net Din 8 ..... 19.
NEC
Intersect CDR Interface KIT ..... 63.
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ClearVue/SE (w/16mHz Accel.) 1485.
264 SE/30 (24 Bit) ..... 678.
Shiva Corporation
Ethergate ..... 1618.
FastPath 4 ..... 1895.
NetBridge ..... 338.
NetModem V.32 ..... 1345.
Netmodem V2400 ..... 428.
Netserial ..... 274.
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Supra Modem 2400 Plus ... 158.

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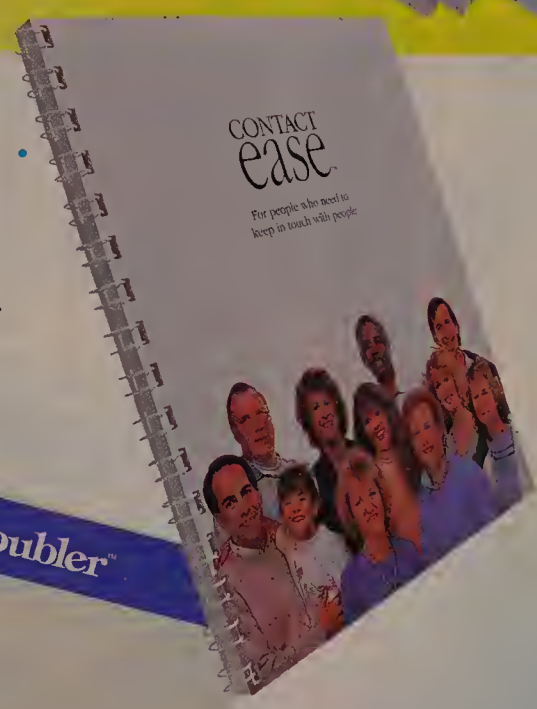
Contact Ease *$258*

Westware A Rolodex ™, Mail merger, & phone dialer all in one. Helps you keep intouch—it never lets anything fall through the cracks. "....the simplest interface of any contact packge we've see",...a solid hit"—*MacWeek*

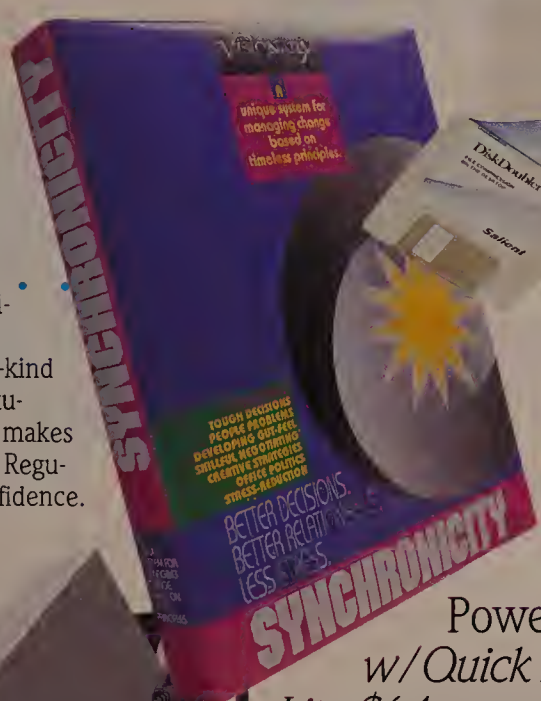


DiskDoubler *$45.*

Salient Expand your disk drive capacity quickly, easily, and safely. Dramatically increases the storage capacity of any Mac drive. "Performance is outstanding," says MacUser Magazine—4 1/2 mouse rating.

Synchronicity *$38*

Visionary Software Better decisions. Better relationships. Less stess. Synchronicity is a one-of-a-kind creative decision-making and intuition development program that makes life a game you win more often. Regular use improves timing and confidence. It's fun too!



Power Key *w/Quick Keys Lite $64.*

Sophisticated Circuits Turns on your Mac and peripherals from the keyboard and shuts everything down from the Special menu. Can be programmed with an on/off schedule. Great for communications and back-ups. Four outlets provide surge and overload protection and noise filtering. SE and II compatible.

Casio
CasioLink/Mac ... 89.
B.D.S.S.
SF-9500 ... 245.

Fellowes
Copy Arm (Non-Magnetic) ... 6.
Fan-File ... 5.
Step Cube ... 9.

Golden Ribbons
Imagewriter Multi Color ... 8.
Imagewriter Ribbons - Black ... 4.

Goldstein & Blair
Macintosh Bible 3.0 ... 19.

I/O Design
MacLuggage
Ultimate Neon-Pink, Yellow, or Green ... 88.
Ultimate SE Black Or Navy ... 79.

Kensington Microware
Apple Security Kit System ... 33.
MacII Stand W/Exten.Cables ... 64.
SE Radiation/Anti-Glare Filter ... 52.
Tilt Swivel ... 22.
Turbo Mouse (512k & Plus) ... 109.
Turbo Mouse Adb ... 109.

Keytronics
MacPro 105 ADB Keyboard ... 115.

Kraft
Premium III ADB ... 49.
KM 30 ADB ... 59.
Quickstick (512k & Plus) ... 39.

Kurta
ADB(12"x12") Tab W/Styl ... 384.
ADB (12"x17") Tab W/Styl ... 619.
ADB(8.5" x 11") Tab W/Styl ... 278.

Macs Place
7 Outlet Noise/Surge ... 15.
Mac Tool Kit ... 14.
Mouse Pad
Black, Blue, Gray Red ... 6 ea

Maxell
150Meg BU Tape CS600XD ... 22.
60Meg BU Tape CS600HD ... 18.

MSC Technologies
ADB Trackball ... 69.
Little Mouse+ ... 74.
Little Mouse ADB ... 74.

Targus
Imagewriter Bag Black ... 45.
Mac/SE Bag Black ... 54.
Deluxe SE Extended Bag
Black,Navy,Gray,Wine ... 68ea

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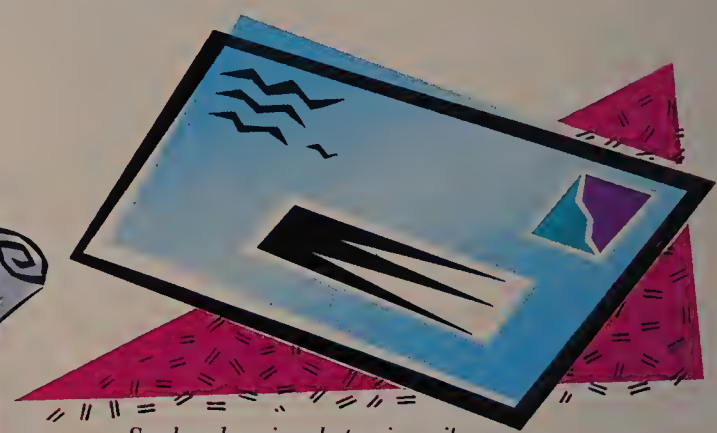
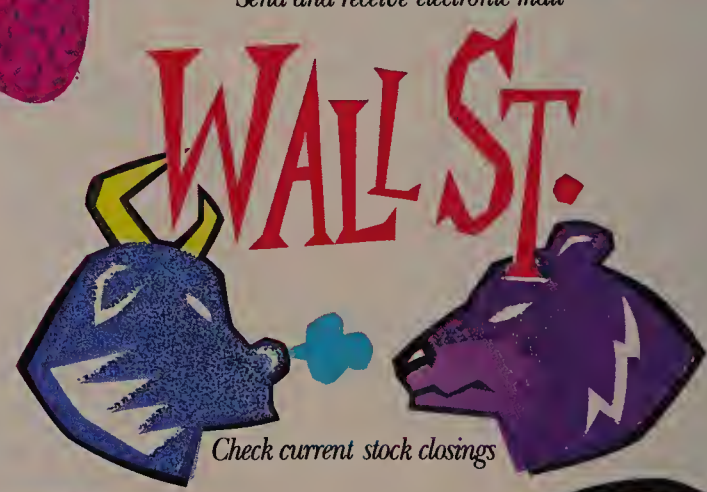
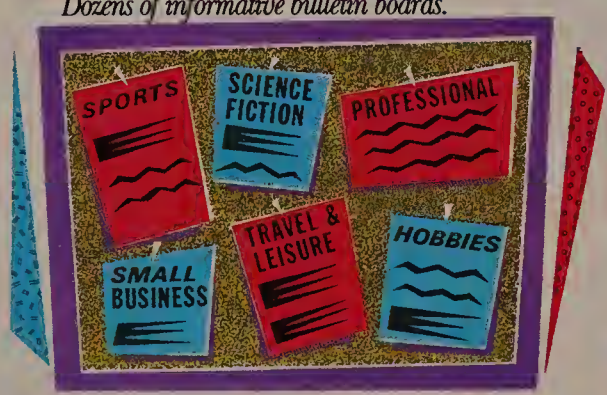


Send and receive electronic mail



Check current stock closings

Play single player games



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Now enjoy unlimited non-prime time usage of over 100 popular GEnie Service features. For just $4.95 a month.* You get everything from electronic mail to exciting games and bulletin boards. Nobody else gives you so much for so little.

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Just follow these simple steps.

1. Set your communication software for half duplex (local echo), up to 2400 baud.
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3. At the U#=prompt, enter XTX99494,GENIE then press RETURN.
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GE Information Services

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Circle 359 on reader service card

NEW PRODUCTS

Edited by Mary Margaret Lewis

This section covers Macintosh products formally announced but not yet evaluated by Macworld. All prices are suggested retail. Please call vendors for information on availability.

HARDWARE

8LC Display Board and Display System

Display board provides 256 colors or grays on a 19-inch color monitor for the Mac LC. Supports image resolutions of 1024 by 768 and 640 by 870 pixels at a 75Hz screen refresh rate. Includes two- and four-times-original image enlargement. Extended Desktop feature creates a larger desktop window for working with large documents. $995; 8LC Display System (includes 19-inch monitor) $3795. RasterOps, 408/562-4200.

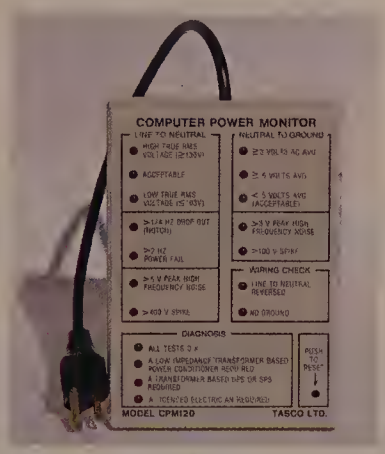
Com-Lok

Com-Lok

Hardware security unit that protects networked Macs or other personal computers from unauthorized remote access and network-transmitted viruses. Unit operates independently of the modem to act as a barrier between the computer and phone line. Callers must enter an 8-digit security code to be connected to the computer. $5995. Upgrade General Import Export, 612/738-8118, 800/535-3751.

The Complete Fax Modem

Portable fax/data modem for 9600-bps send-and-receive data transmission. Awakens the Mac from sleep mode when an incoming call is detected; travels well. $599. PSI Integration, 408/559-8544.



Computer Power Monitor

Computer Power Monitor

Device designed to monitor line voltage and indicate power-line variations that are known to cause computers and other voltage-sensitive equipment to malfunction. Unit measures true Root Mean Square voltage, recommends typical solutions for indicated problems, and checks wiring polarity. $538. Tasco, 303/762-9952, 800/999-9952.

The Cork 30

CPU with 68030 microprocessor; 25MHz 68882 co-

The Cork 30

processor; built-in 8-bit color capability; three NuBus expansion slots; 4MB of RAM upgradable to 8MB; 1.4MB floppy drive; standard Apple SCSI connectors and digital sound; and built-in modem and voicemail capabilities. $2999. Cork Computer, 512/343-1301, 800/621-2675.

I/O Port System

System that attaches to the Macintosh with standard keyboard cables to monitor and/or automate most electrically operated devices found in the home. Can monitor fire and security systems, operate automatic sprinklers, program lights to turn on and off. Also includes modules for writing your own software. $479. Ansan Industries, 815/874-6881.

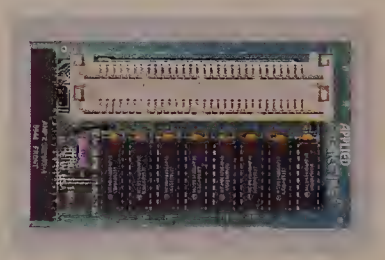
I/O Port System

Mac Classic Hard Drives

20MB and 100MB internal hard drives for the Mac Classic. 20MB $299; 100MB $999. CMS Enhancements, 714/222-6000.

MacRam Classic

1MB to 3MB memory board for the Mac Classic. With 1MB RAM $189; with 2MB RAM $298; with 3MB RAM $407. Applied Engineering, 214/241-0055.



MacRam Classic

PDS Adapter Card

Adapter board for the Macintosh IIsi that allows most of the boards designed for the Mac SE/30 to work in the processor-direct slot of the IIsi. Corrects the most-common compatibility problems between SE/30 boards and the PDS. $149. Nutmeg Systems, 203/966-7972.

QuadraLink

Serial board that enables Mac II–series owners to use four serial devices in addition to the current two and to control them individually and simultaneously. $299. Applied Engineering, 214/241-0055.

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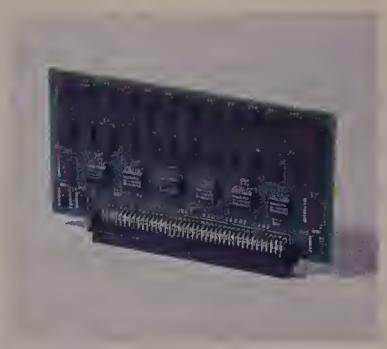
SE Upgrade System

Upgrade system replaces an existing Mac SE with a streamlined version that can be purchased with a 14- or 15-inch monochrome monitor. Upgradable by user or by dealer. Without monitor $845; with 14-inch monochrome display $995; with full-page monochrome display $1295. MicroMac, 714/363-9915.

SE Upgrade System

Technology Work Cache Card

Cache board for the Mac IIci. Uses 25-nanosecond static RAM, which makes the board more than three times as fast as the standard dynamic RAM used by the Mac IIci's logic board. Designed to boost the Mac's processing speed by 30 to 70 percent. $299. Technology Works, 512/794-8533, 800/688-7466.



Technology Work Cache Card

Umax Color Scanner

24-bit color scanner for use by desktop publishers. Scans a document three times (to red, blue, and green signals) and reads through a single charge-coupled device sensor or a single light source with a three-color filter. Connects via SCSI interface. $2495. Umax, 408/982-0771.

Umax Color Scanner

SOFTWARE

Alge-Blaster Plus

Educational software that covers first- and second-semester algebra in one program and includes a graphing game. Designed for ages 12 to adult. This program offers a step-by-step approach to algebra and optional hint screens that can be used in problem solving. 1MB min. memory. Single version $59.95; teacher's version $69.95; five-disk lab pack $179.95. Davidson & Associates, 800/556-6141, 800/545-7677, P.O. Box 2961, Torrance, CA 90509.

Balloon Stack

HyperCard stack illustrating method for creating 34 balloon animals. Figures are illustrated and cross-referenced by name and category. Screen images are provided for each finished figure. Comes with approximately 30 balloons. 1MB min. memory. $35. BugByte, 302/994-1502, 800/284-9220.

Balloon Stack

With the HP LaserJet III, you can

© 1990 Hewlett-Packard Company PE12010
*Serif depicted conceptually represents the benefit of variable dot sizes.
† Suggested U.S. list price for full Macintosh configurations including minimum required memory.
Adobe and PostScript are registered trademarks of Adobe Systems, Inc. in the U.S. and other countries.

Bola32 Layout Software

Graphics and presentation software designed to run with the Truevision NuVista series of boards. Has the ability to manipulate text; lets the user assign text and images any degree of transparency and give a drop shadow any offset. Can produce video overlay effects and multidirectional color blends. 2MB min. memory. $895; add-on font pack $495. Flamingo Graphics, 617/661-1001.

Cheshire

Utility that lets Microsoft Word, PageMaker, MacWrite II, and MacDraw II produce business charts. Includes 21 chart modules and a developer's kit that enables third parties to write their own Cheshire modules. 1MB min. memory. $125. Abbott Systems, 914/747-3116.

ClickArt EPS Sports & Games

Collection of more than 170 PostScript illustrations created by professional artists. Image categories include team sports (football, baseball, soccer); individual sports (skiing, tennis, and running); and

ClickArt EPS Sports & Games

adventure sports (scuba diving, hang gliding). Includes images of sports equipment, court and field layouts, and lawn and board games. 1MB min. memory. $129.95. T/Maker Company, 415/962-0195.

Clients & Profits

Job costing, tracking, and billing software for small advertising agencies and design studios. Simplifies bookkeeping to help organize income, costs, and expenses. Program is upgradable as a small agency grows. 1MB min. memory. $1195. Working Computer, 619/945-4334.

The Competitive Investment Trader

Software to help private investors track their investment trading activity and determine the profit from every transaction. Can be used for actual trading accounts or to set up fictitious accounts to track mock portfolios. Available as a stand-alone application or to be used with FoxBase+/Mac. 2MB min. memory. FoxBase+/Mac version $49; stand-alone application $79; demo copy $5. Komodo Software, 145-6200 McKay Ave., Ste. 108, Burnaby, BC, Canada, V5H 4L7.

ContoursPro

Contouring program based on complex mathematics; compatible with AutoCAD, Claris CAD, MiniCAD+, and any other CAD program that reads DXF. Input may be formatted as *x-y-z* triples or surveyor's units. Output may be generated in DXF, MiniCAD, AutoLISP, or PICT formats. 2MB min. memory. $495. Graphsoft, 301/461-9488.

Destination: Mars

Educational software designed to help students ages 11 to 17 familiarize themselves with information on space provided by NASA and develop critical-thinking and decision-mak-

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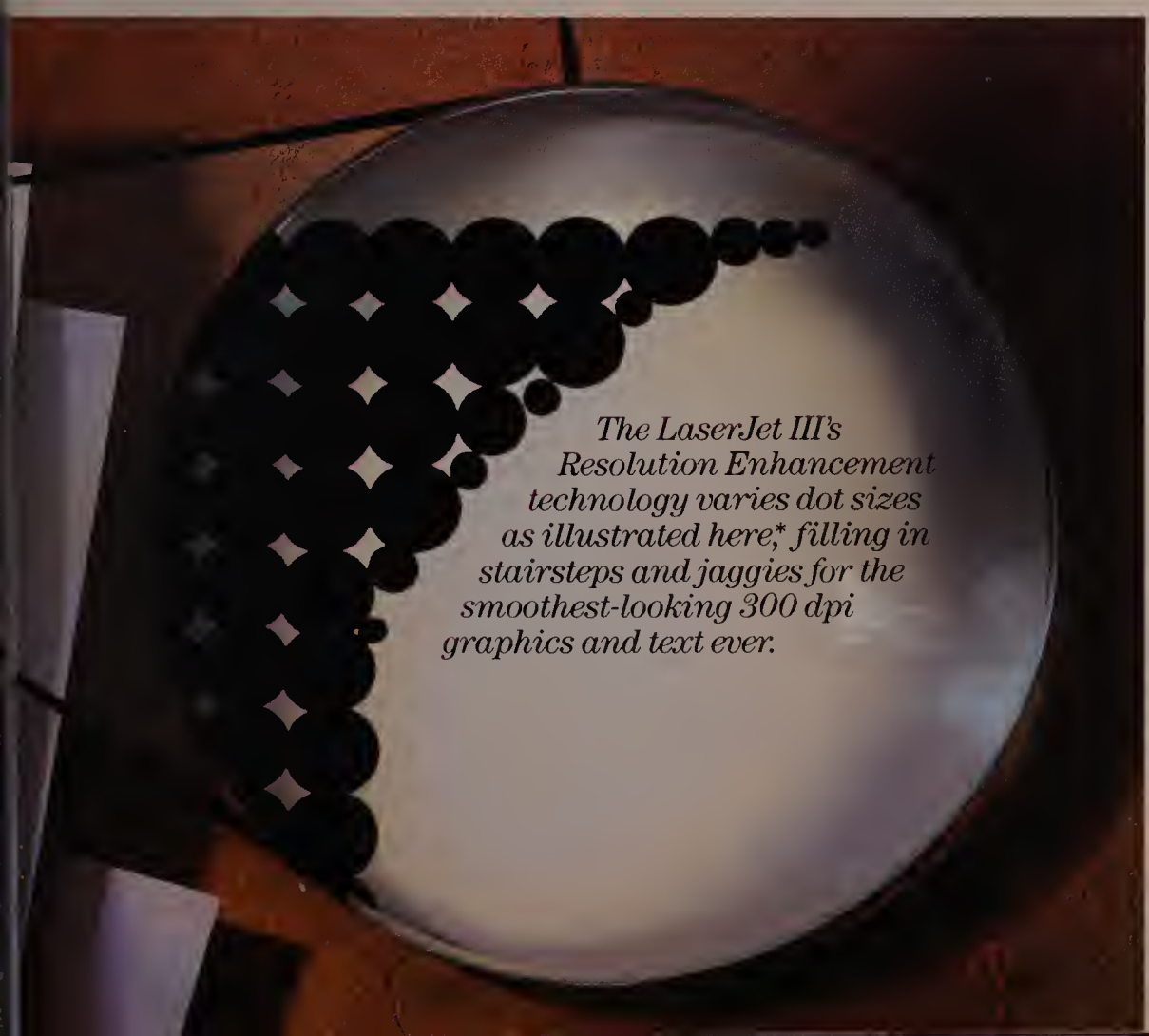
refine your characters.



The HP LaserJet III printer delivers the most refined 300 dpi print quality ever. And it's easy to use. When configured with Adobe® PostScript® and AppleTalk interface, the LaserJet III is completely compatible with your Macintosh. All for only $3,700†.

HP offers other Macintosh compatible LaserJets. The new LaserJet IIID printer with increased paper-handling capability for $5,125†. And the affordable LaserJet IIP printer for only $2,595†. Call **1-800-752-0900, Ext. 1168** for the name of your nearest authorized HP dealer and ask for the Macintosh versions of the LaserJet line.

There is a better way.

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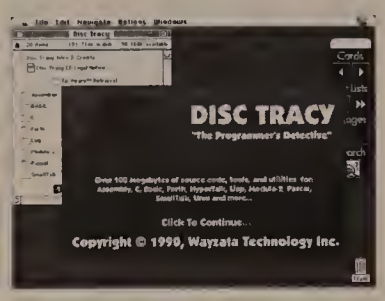
ing skills. Students use a database, a mission book, and a detailed map in a simulated journey to Mars. Those who reach the destination will land the spacecraft, perform field experiments on the planet's surface, and erect a base site. 1MB min. memory. $59.95. Compu-Teach, 203/777-7738, 800/448-3224.

Disc Tracy—Programmer's Detective

Collection of more than 100MB of source code and utilities for the Mac programmer on CD ROM. Disc is organized into categories



Disc Tracy

such as Assembler, Basic, C, Documentation, and so on. Includes database of the source code, accessed using TextWare database retrieval engine. 1MB min. memory. $139. Wayzata Technology, 612/447-7321.

Easy4D

Application shell and development environment for 4th Dimension database developers. Provides online context-sensitive help; built-in word processor; custom report management; import/export manager; keyword entry system. Supports multiple input and output layouts in each file. 1MB min. memory. $299. Natural Intelligence, 617/266-7858.

FM Waves Business Cartoons

Clip art collection of humorous business cartoons

FM Waves Business Cartoons

depicting such typical office images and clichés as maniac boss, clock watcher, inbox, and networking. Images may be edited using standard paint programs. Each FM Waves volume contains 70 to 100 images. 1MB min. memory. $144. FM Waves, 415/474-7464.

FolderJump

INIT that adds functionality to the standard Open and Save dialog boxes. Enables you to save commonly used folders and to move between folders and volumes quickly, without touching the mouse, via the keyboard or using pop-up menus. 512K min. memory. $49. CraZ Software, 508/521-5262.

IA MediaTracks Guides

CD ROM compilation of MediaTracks tutorials for major Mac applications. Contains tutorials for Microsoft Word, MacWrite II, WriteNow, Aldus PageMaker, QuarkXPress, DesignStudio, and others. 1MB min. memory. Disc $100, plus $50 for each of the application tutorials you want to unlock. It's Alive, 617/437-1718.

InTouch

Desk accessory that stores an unlimited number of names and addresses with up to 14 pages of zoomable, scrollable notes attached to each record. Date-and-time-stamps notes; dials phone numbers; prints envelopes and labels; and copies addresses to and from other applications. 512KE min. memory. $69.96. Advanced Software, 408/733-0745.

With the HP ScanJet Plus, you've

The HP ScanJet Plus scanner provides 8-bit photographic-quality scanning.

That means 256 shades of gray for the hottest-looking output from your Mac. And it's so easy, too. At the click of a mouse, you can get negative or mirror images, as well as scaling in 1% increments from 4-200%. All for $2,190,* about what you would expect to pay for a 4-bit scanner.

So if you want the richest, most detailed images from your Mac, you've got it made with Hewlett-Packard. Call **1-800-752-0900, Ext. 1005** for your authorized HP dealer.

There is a better way.

For all its amenities, ease of use, good image quality, and low price, *Publish!* recommends the HP ScanJet Plus as their "Best Buy."

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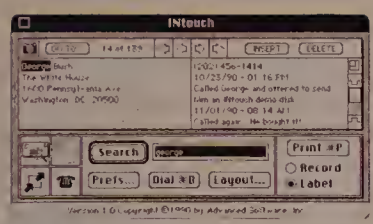

InTouch

MacSleuth

Systems-analysis tool designed for use by network administrators, technicians, and other technically oriented users. Can be used to diagnose information concerning NuBus slots and SCSI interfaces; locates all INITs; displays settings in permanent RAM (PRAM). Can identify all nodes currently connected to an AppleTalk network. Could be used by a network administrator to determine software that is currently running on remote nodes connected to the network. Generates reports; contains context-sensitive help. 1MB min. memory. $149. Dariana Technology Group, 714/994-7400.

MapArt

Collection of clip art maps that includes 4 world maps, 12 regional maps that show country borders, and 23 country maps that show state and provincial borders. Maps include country and major city as well as names, and latitude and longitude lines. 1MB min. memory. $179. MicroMaps, 609/397-1611.

MapArt

Max

Graphic programming environment in which complex applications can be built by linking together simple modules. Constructs applications that process data in real time for use in the design of applications that incorporate MIDI, music, video, digital audio, or animations. Contains 150 objects that handle calculations, hardware communications, and user interface functions. 1MB min. memory. $395. Opcode Systems, 415/369-8131.

Negotiator Pro

Program to improve personal influence and negotiation skills. Provides structured planning and preparation, a small expert advisory system, 27 tactical options, and a summary of current negotiation theory in more than 120 hypertext entries. Combines hypertext, edit windows, and training. 2MB min. memory. $299; $99 each for ten or more copies. Beacon Expert Systems, 617/738-9300.

NetControl

Network administration software that provides detailed information about all software and hardware connected to a Macintosh network. Information includes reports on the status and dynamics of a network, to assist in resource management, and recommendations for changes in equipment or software where that might boost the performance of a network. 1MB min. memory. Single-zone administrator $249; multiple-zone administrator $649. International Business Software, 408/522-8000.

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got it made in the shades.

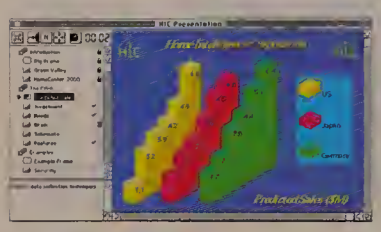
*Suggested U.S. list price. © 1990 Hewlett-Packard Company PE12004

Once Upon a Time: Volume III

Third in a series of educational software designed for children ages 6 to 12. This volume, Journey through Time, focuses on three story themes: space odyssey, medieval times, and wild west. Includes a digitized voice, graphics, and book-making capabilities. 1MB min. memory. $49.95. Compu-Teach Educational Software, 203/777-7738, 800/448-3224.

OverView

Presentation software for managers who frequently customize presentations to suit different audiences.



OverView

Integrates with user's existing word processing, drawing, and spreadsheet programs to create presentations from their documents. Users can import images via the Clipboard or print slides directly into OverView from any application using the LoopWriter driver, which is included. 1MB min. memory. $159.95. Loop Software, 415/326-4803.

PassProof

Security protection system that combines hardware and software locks to prevent unauthorized access. Comes with physical lock and security software that logs user activity, automatically blanks the screen after a specified time, and offers password protection. 1MB min. memory. $99.95. Kensington Microware, 212/475-5200, 800/535-4242.

PassProof

Periodic Law

Chemistry database that contains information for approximately 13 properties of the first 103 elements. Helps students to study the periodic table and the group trends of the elements. Users can search for elements using up to three criteria. Program displays in text, graph, and tabulated lists. 1MB min. memory. $72. EME, 203/798-2050, 800/848-2050.

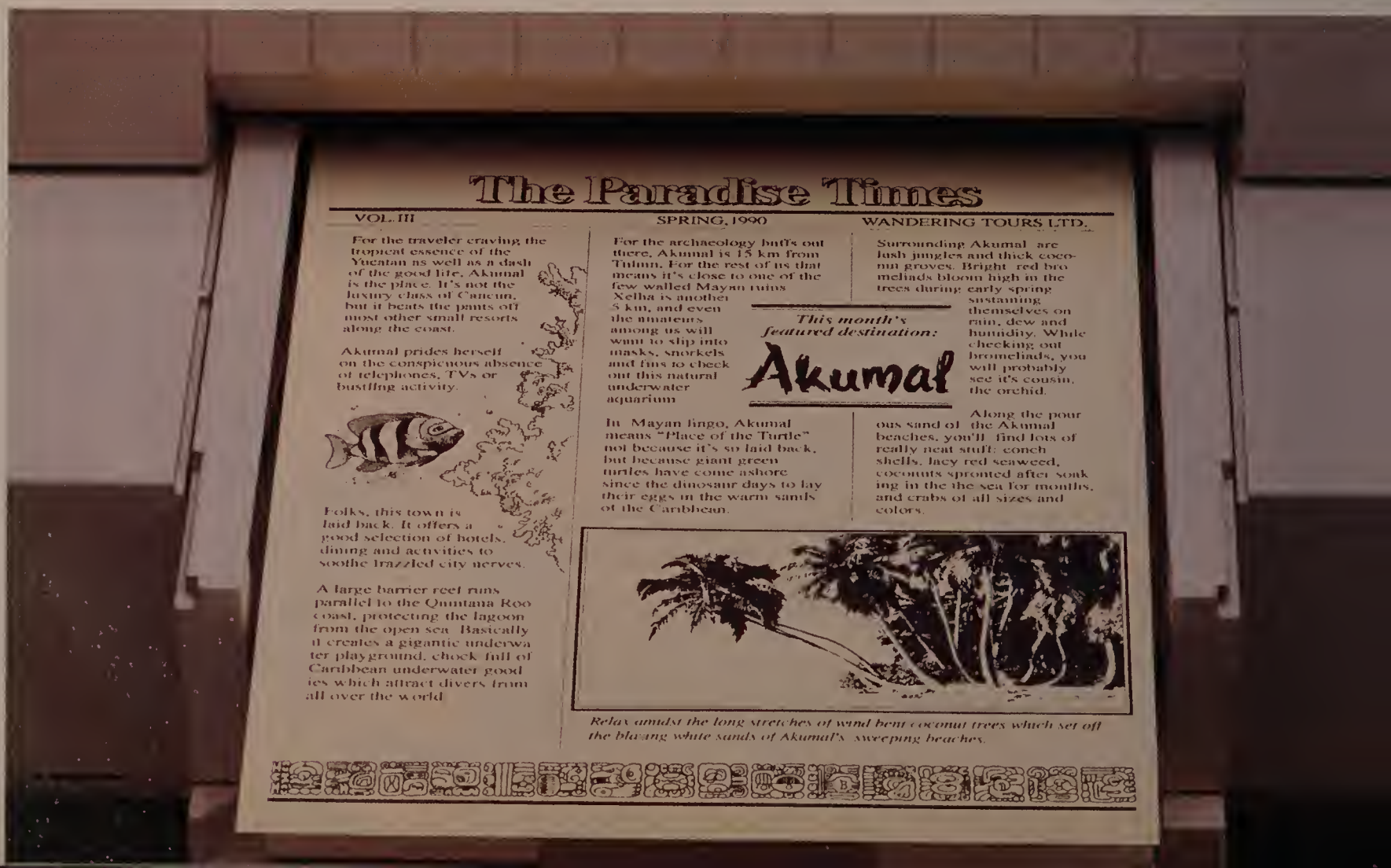
Personal Trainer for the SAT

Software designed to help high school students obtain higher Scholastic Aptitude Test (SAT) scores. Gives step-by-step method of preparing for SAT; scores and analyzes practice SAT tests, then creates up to six individualized study programs for each student. Charts show score progress. 1MB min. memory. Single-user version $59.95; teacher's edition $69.96; five-disk lab pack $229.95. Davidson & Associates, 213/534-4070, 800/556-6141, 800/545-7677.

Projectile Motion

Open framework for learning how to set up, solve, and understand the physics of free-fall and projectile motion. Multiwindow environment. Contains an animated simulation of various trajectories in real time. 1MB min. memory. $64. EME, 203/798-2050, 800/848-2050.

With the HP DeskWriter, you can



*Suggested U.S. list price. © 1990 Hewlett-Packard Company PE12005
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ProWheel

Desk-accessory proportion wheel for desktop publishing and illustration. Can be used with a DTP program or as an aid with manual

ProWheel

layout. Converts between units of measurement such as picas, points, DTP picas, DTP points, inches, millimeters, and fathoms. 512K min. memory. $29.95. DesignSoft, 708/653-2700, 800/426-0265.

Rulers Add-On Package

Add-on software for Word Solution Engine (a Datapak text-edit replacement tool). Provides paragraph formatting and additional word processing features, such as individual justifications and indentations for paragraphs; line-spacing control; 18 tab stops; tab leaders; optional borders; and ruler drawing support. 1MB min. memory. $170. Data-Pak Software, 206/573-9155.

The Sports ROM

Collection of sports clip art. Contains 165 clip art images from 18 different sports. Covers everything from archery to wrestling, including car racing, baseball, basketball, Frisbee, fencing, and so on. Designed to produce well-defined lines and tonal definition. Includes from 3 to 20 individual and group action images for each sport. Requires a CD ROM drive. All files are in TIFF format. 1MB min. memory. $69.95. Educorp Computer Services, 619/536-9996, 800/843-9497.

Stopwatch

Desk accessory that keeps track of work time, whether you are working on the computer or not. User selects timer when work commences and ends, and

Stopwatch

inputs pertinent billing information. Keeps timesheet for work performed. 512K min. memory. $29.95. DesignSoft, 708/653-2700, 800/426-0265.

Sundance System

Video postproduction software and hardware system for the Mac. Includes Q-Base scene-logging database; Q-Cut editing software; and the MMI, a proprietary multimachine interface device. Q-Base creates a job information record for each new job with an integrated footage log to store SMPTE Time Code In and Out points and a description for each scene. Q-Cut software gives the Mac editing controller capabilities. MMI connects to the modem port to enable control of up to 15 source machines. 1MB min.

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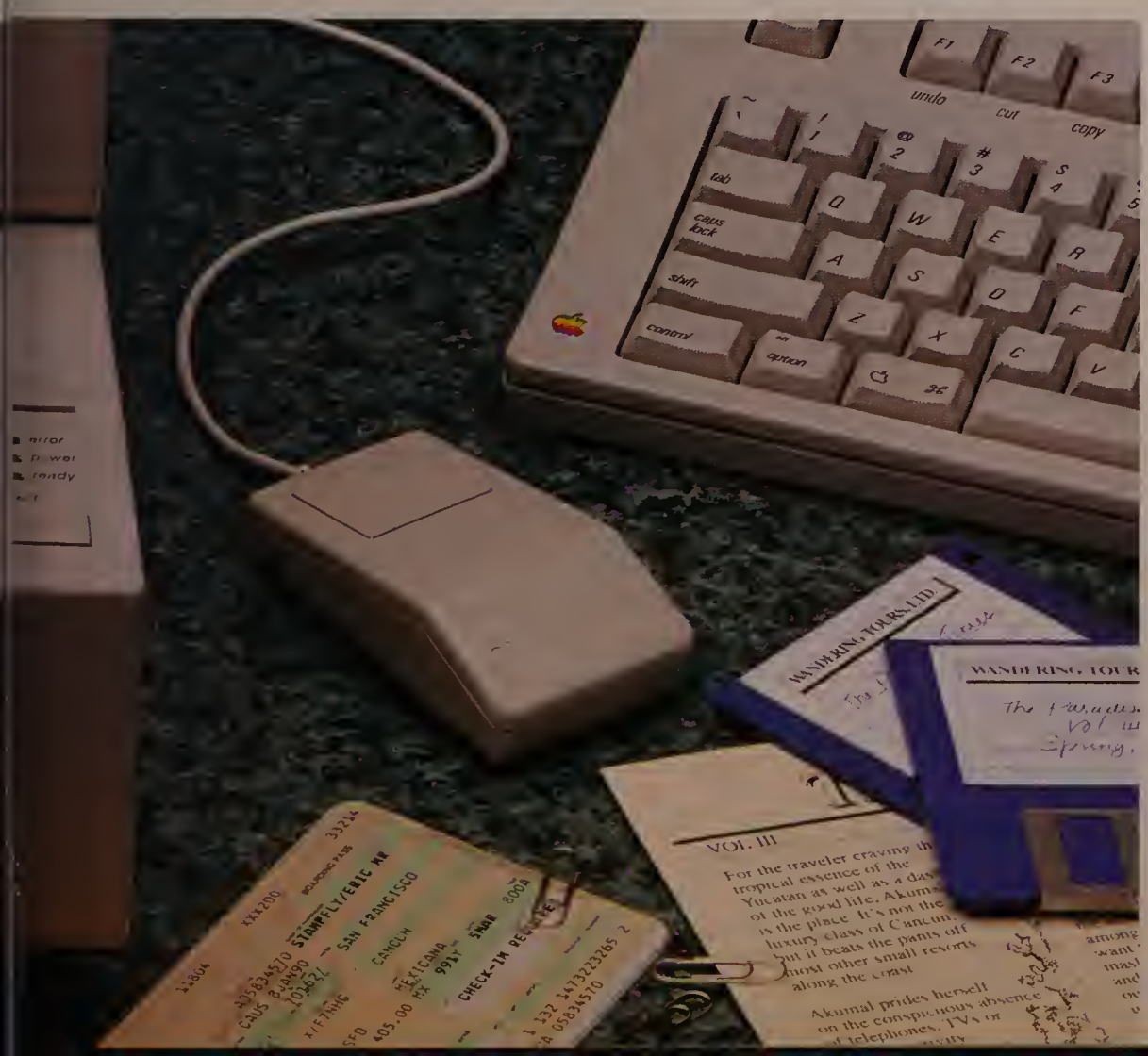
have it all. (But keep it to yourself.)



The HP DeskWriter printer puts laser-quality printing right at your fingertips.

With a small size and a $995* price tag, the DeskWriter printer easily fits on your desk and in your budget. And its advanced 300 dpi inkjet technology lets you print sparkling text and detailed graphics.

The DeskWriter is also designed for easy use with your Macintosh, and has both serial and Apple Talk interfaces. It even includes scalable and outline fonts. Combine that with the DeskWriter's whisper-quiet operation, and keeping it to yourself will be that much easier. So call **1-800-752-0900, Ext. 1004** for your authorized HP dealer.

There is a better way.

HEWLETT PACKARD

memory. Q-Base Scene Logging Database $875, MMI $1395; Q-Cut with Q-Base software $3950. Sundance Technology Group, 214/869-1002.

Upfront

Conceptual 3-D application software for use by architects, interior designers, facility planners, and set designers. Developed as a complement to CAD software, to be used in the initial stages of the design process to produce detailed drawings and modeling after general direction has been determined. $895. 1MB min. memory. Alias, 416/362-9181.

ACCESSORIES

Carrying Case

Lightweight, shock-resistant carrying case for compact Macs. Holds Mac, up to two external hard drives or portable printers, and extended keyboard; has an exterior disk pocket that holds 12 disks plus boxes, cords, and accessories. Includes two combination locks and shoulder strap. Fits all compact Mac models. $119. Pro Tec International, 714/441-0117, 800/325-3455, 800/523-3555 in California.

Carrying Case

DeskInject

Ink-cartridge refill kit for owners of HP DeskWriters and DeskJets. Kit consists of a reusable plastic injection tool, eight ink cartridge refills, a quantity of alcohol

DeskInject

prep pads, and illustrated instructions. $25. Synapse, 415/621-2743.

Disk Dispatcher

Organizer and dispenser for 3½-inch disks. Stores up to 20 disks, which can be automatically accessed by pushing a selection button that ejects the disk partway out of the container. Comes with a travel lock. $19.95. Select Products, 805/524-1747.

ISOBAR-GS Surge Suppression Line

Surge-suppression line that comes with a warranty covering both the ISOBAR-GS Surge Suppressor and the equipment plugged in to it. Provides line-noise filtering and RFI/EMI filtering and is housed in an aluminum case. $59.95. Tripp Lite, 312/329-1777.

Keyboard Shelf

Stand and keyboard holder for compact Macintoshes; holds the keyboard when it is not in use. Contains a recessed storage compartment; raises the Mac 4¼ inches to bring it into alignment with the user's eyes,

Keyboard Shelf

Pigments for your imagination.

HP color printers let you draw splashy color from your Macintosh.

Entertain your thoughts with HP's PaintJet and PaintWriter XL color printers. Both are fully Mac-compatible and let you use all Quickdraw-based software applications. That means high-quality Macintosh II output in 16.7 million colors.

Print on paper or transparencies with 13 scalable outline fonts. And for shared use, the PaintWriter XL offers AppleTalk, faster speed, and auto sheet feed. For sample output and the name of your authorized HP dealer, call **1-800-752-0900, Ext. 1167.**

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neck, and back. $59.95. Kensington Microware, 212/475-5200, 800/535-4242.

Trackmate

Diagnostic utility and data-protection system for floppy drives. Comes with menu-driven diagnostic software and maintenance disk with cleaning brushes on either side. Includes a cleaning solution in a pen-like applicator. Software diagnoses key drive functions such as head condition and drive speed; manages cleaning routines. $34.95. Trackmate America, 408/356-0795.

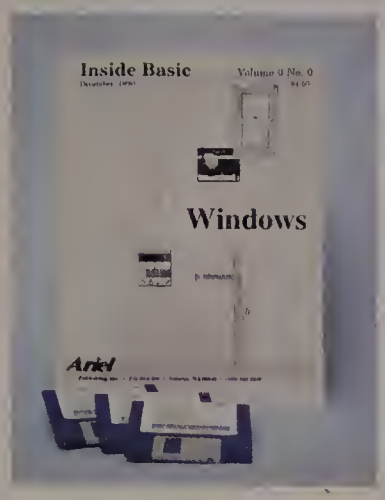
BOOKS

Campus Computing

Reference guide for college students who are using personal computers or mainframes on a campus network. Covers desktop publishing for papers; electronic research with online library catalogs, abstracts, indexes, and other databases; and computer networks to contact professors and friends in remote locations. Offers advice on choosing the computer that best meets your needs, where to find free computer labs, and how to use school consulting services. Written by Helmut Kobler. $8.95. Lyceum Publishing, 415/841-7376.

Inside Basic

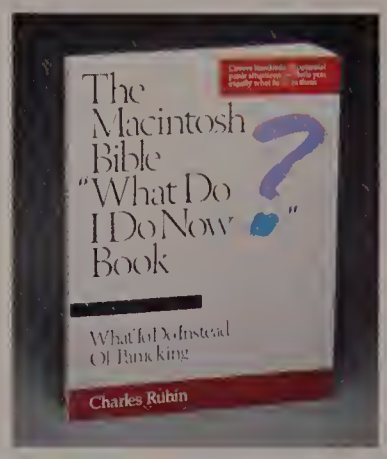
Technical journal for Macintosh BASIC programmers. Includes articles covering flickerless window updates; grafports; color grafports; regions (including animation with regions); and sending keystrokes to an edit field in a background window. Magazine focuses on teaching programming skills and techniques. One year $36.95; two years $69.95. Ariel, 509/923-2249.



Inside Basic

The Macintosh Bible, What Do I Do Now?

Covers virtually every error message, explaining the problem that produced the error and discussing how to resolve it. Deals with such problems as wrong fonts appearing in printout and pointer not responding to mouse. 191 pages. Written by Charlie Rubin. $12. Goldstein & Blair, 415/524-4000. M



The Macintosh Bible, What Do I Do Now?

To have your product considered for inclusion in *New Products*, send an announcement with product name, description, minimum memory, peripherals required, pricing, company name, and phone number (and two copies of the software) to New Products Editor, *Macworld*, 501 Second St., San Francisco, CA 94107.

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INTROD
THE 1991 TA
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[illegible] the [illegible] software combined [illegible] software. While worry that something in your return makes [illegible] the IRS.

All the number crunching is done in under 5 seconds. Then, when you're finished, you can print out and mail your return right off your computer.

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You'll find out why over 3 million returns were prepared with TurboTax last year alone. Or, for that matter, why more PC users use TurboTax than any other tax software.

Now TurboTax has come to the Macintosh.

And, for even more people, thankfully, taxes will never be the same again.

Circle 147 on reader service card

I'm good at desktop publishing. But desktop accounting scared me.

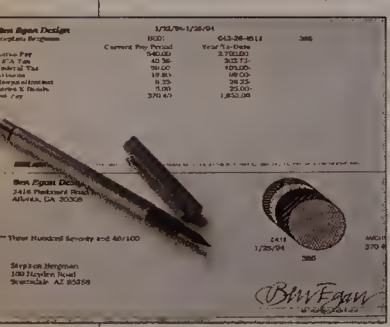
The thought of doing bookkeeping for my design studio got me uptight.

When I heard "balance sheet," I broke into a sweat. I know type, advertising, printing. Now I was forced to do our books.

No choice.

We were on our third part-time bookkeeper in eleven months, and she was called away suddenly. Sound familiar?

But I'm the boss and the buck stops with me. We had bills to pay, payroll checks to write, invoices to send, taxes to set aside.



And deadbeats to collect from–only I had no idea who owed us how much or for how long. Some suppliers may have even thought of *us* as deadbeats. I needed to know our cash flow, and get a handle on all this. But I didn't have a lot of time.

Step one: find an accounting program that feels as familiar as our Macs, that starts out easy, but has lots of reserve firepower for later on.

I found atOnce! The manual looked orderly. I dug in...

The familiar with the unfamiliar

atOnce! starts you off with a tutorial that uses HyperCard, one of my old favorites. I was at home.

Numbers are my nemesis, but the tutorial was actually fun and got me comfortable. It takes you step by step through the program, and gives you some easy-to-swallow accounting basics so you're not reading a foreign language. There's context-sensitive help, just in case.

And while you learn, you can start to set up your books. So it doesn't come in a flash and you sweat a little. But you do it and you learn.

I started off light. Double-clicked on one of the default charts of accounts and my General Ledger was practically set up for me. Then entered a few client names in Accounts Receivable, to get an idea of what was coming in. Prepared six invoices–and atOnce! calculated sales tax. Nice. Printed the invoices which I redesigned in atOnce!–realign a field here, change a font there. The usual.

Then ran a Customer Aging Report to identify the slow-payers (I had no idea such a terrific thing was even possible).

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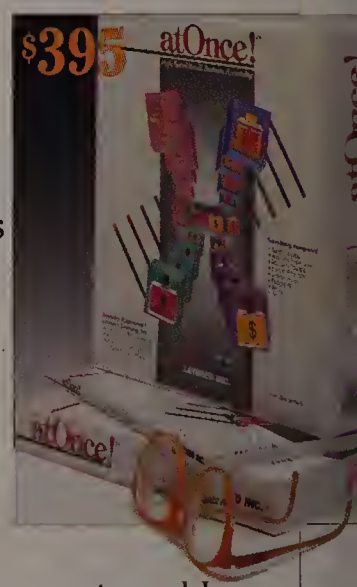
MacUser:
1989 Editor's Choice Award and 4.5 mice

30 days free support

30-Day Money Back Guarantee if you bought it from Peachtree. You can get your money back, minus a $25 re-stocking fee.

What I didn't know was costing my company

I discovered a key client who hadn't paid in two months. I called and collected and now *he* wants to know about atOnce! I wrote payroll checks for the staff, and sent our bank a balance sheet I printed out myself–no sweat.



From fear and loathing to passion. Now I even study the management reports atOnce! generates.

I'm still an art director. But atOnce! helped me become a better businessman!

A hidden bonus that made my day

When our bookkeeper returned, I showed her atOnce! Now she's back doing the books, even makes sure my plants are green, and I can supervise like a boss should. Putting the books on the Mac gives me the numbers I need when I want them. It lets me take control of income and expenses.

Here's some free advice: Take control of your *own* business. Buy atOnce!

Peachtree Software
1505 Pavilion Place
Norcross GA 30093
800 247-3224 OR 404 564-5800

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Circle 100 on reader service card

Quick Tips

Making gray text readable, developing simple HyperCard stacks, settling font disagreements, and more

BY LON POOLE

Several readers jumped on me for claiming last October that the blank space around the edges of the Mac screen is useless. Paul Velasco of Flossmoor, Illinois, for example, agreed that although most monitors are fuzzier toward the edges of the screen, this space can still be useful. For instance, you could use the space for the menu bar, scroll bars, tool palettes, and other noncritical items. So what if they are slightly blurry?

You can expand the display area on some Mac systems from 640 by 480 pixels to 704 by 512 pixels with the shareware utility MaxAppleZoom by Naoto Horii of Belgium. MaxAppleZoom is a startup document (INIT file) that reprograms the video board to display across the entire picture tube. Version 1.3 (the latest at this writing) works only with Apple's Mac II video board on a Mac II, IIx, IIcx, or IIfx. It doesn't work with built-in video (on the LC, IIsi, or IIci), the latest Apple display boards (the 4•8 and 8•24), display boards made by other companies, or multiple-monitor configurations. It works best with Apple 13-inch RGB color monitors made in 1989 or later, though it may also work with an older Apple 13-inch monitor or a Sony CDP-1302. To see all of the larger display area, you may have to fiddle with the picture-size controls located behind a removable panel at the back of the monitor. You adjust the horizontal and vertical sizes separately, and keeping them congruent can be difficult. MaxAppleZoom is available from online information services including CompuServe (file MAZ13.SIT of library 6 in the Macintosh Productivity forum) and America Online (file MaxAppleZoom 1.3 in the Hardware library of the Computing & Software department's Software Libraries).

Disk Waste

You shouldn't blame invisible files such as the Desktop file for all lost disk space, as I did last September. Ben Benhoff of Scottsdale, Arizona, lost 20MB of space before discovering that some programs he uses were allocating temporary work space on the disk and then not releasing it properly. He learned from technical support at AlSoft, publisher of the disk-optimizing program DiskExpress, that Apple's Disk First Aid program (which comes with the Macintosh system software) fixes this problem. Benhoff now uses Disk First Aid prophylactically at least three times a week.

He also passed along an easy way to find out if your disk has wasted space: Put the entire contents of the disk into a new folder and then compare its size shown in the Get Info window to the In Disk amount shown in the icon view of the disk window. The Get Info size doesn't include invisible files, which legitimately account for between 7K and 300K, depending on the number of files on the disk.

Small files can also contribute to lost disk space, especially if there are many on a large hard drive, notes Adam Frix of Columbus, Ohio. For efficiency, the filing system allocates

disk space by the block, not by the byte. Allocation block size is .5K for floppy disks but may be 1K, 1.5K, 2K, or more for hard drives (the larger the drive, the larger the block size). That's why the Finder's Get Info command tells you, for example, that a file containing 1218 bytes occupies 2K (two blocks) on your 80MB hard drive.

Power Answer

Here's the missing answer to Scott Junk's question from October, "Can I turn my Mac and peripherals on and off with the switch on my power strip, or should I use each device's on/off switch?" Most systems work fine if you turn on the power to all devices at once. Some hard drive vendors recommend switching on the hard drive first and waiting 15 to 30 seconds so it's ready when you switch on your Mac. But that can't be done for systems with internal hard drives—and they work fine. An alternative is to use the power strip switch to turn on everything except the Mac, wait a few seconds, and then turn on the Mac. Before switching off the power, be

(continues)

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Circle 35 on reader service card.

TELLTALE FOLDER An empty folder set to View by Icon lets you see how much free disk space you have. (Bonus tip: The Alias folder contains an empty document for each program I use often. To open one of those programs, I double-click on its document in the folder.)

sure to use the Shut Down command (under Finder's Special menu), or your disk directory may become corrupted.

Know Disk Space Available

Several *Macworld* editors like to work with their folder and disk windows in one of the Finder's text views. They also want to keep track of the amount of disk space remaining, which the text views don't report. So they create a new folder on each disk, open it, and position its window above and behind the disk window, as shown in "Telltale Folder." It takes up little room there and always shows the amount of available disk space. By incorporating the disk name in the name of each of these empty folders, they know which disk each pertains to. (Although the editors thought they'd found a new tip, this golden oldie first ran in the May 1987 *Quick Tips.*)

Dear Diary

Q Is there a diary program available in which I can record information by date? I would like to record information I kept over a period of several years pertaining to my mother's health until she finally succumbed to a fatal illness. My comments and observations, some of which are several pages long, were made on various unsorted papers and note pads. I would prefer not manually arranging all the bits of information in chronological order.

Bob Jew
Springfield, Virginia

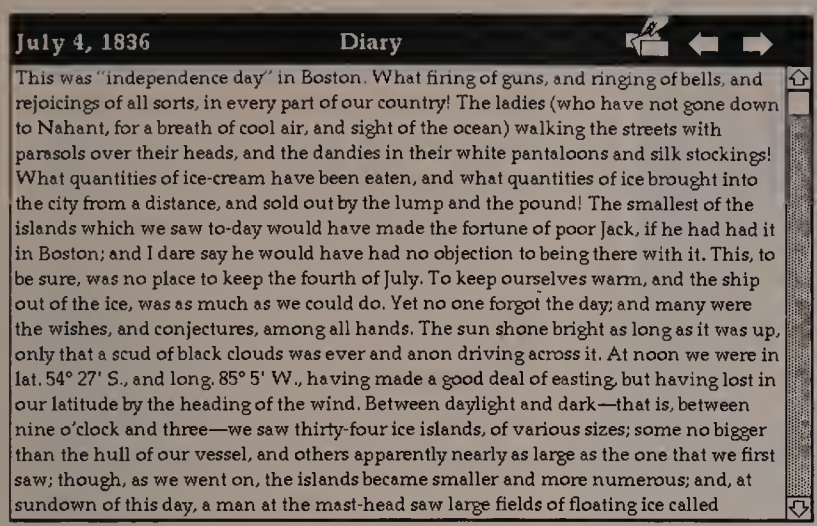
A You can easily create a diary using HyperCard. Follow these steps:

1. Install the HyperCard software as instructed in the HyperCard manuals. Open HyperCard (double-click its icon). The screen fills with icons, and the words *Home Card* or *Home* appear at the top center of the screen. You are looking at the first card of the central HyperCard stack, the Home stack. (HyperCard organizes information in stacks of cards, which in versions earlier than 2.0 are always the size of a Mac SE screen.) Turn to the last card of the Home stack, the User Preferences card, by choosing Last from the Go menu. Set the User Level option on that card to Authoring.

2. Choose New Stack from HyperCard's File menu. In the dialog box that appears, type a name for the diary and select a folder to save it in. Turn off the Copy Current Background option, and click OK. HyperCard creates a new stack with a completely white background for your diary.

3. Choose Background from the Edit menu. Hatch marks in the menu bar indicate that you are now working only on the background layer, which appears on multiple cards. You can now use the painting tools to decorate the background.

4. Choose New Field from the Objects menu. HyperCard creates and automatically selects a five-line text field in the middle of the card. This field will hold the date of each diary entry. Choose Field Info from the Objects menu. In the dialog box that appears, enter *Date* as the field name. Click the Font button and select the font, size, and style in which you want the date displayed, and click OK. Next drag the field to the upper-left corner of the card. Then drag the bottom-right corner of the field up to shrink the field until it's one line deep. The



DIARY STACK You can quickly create a HyperCard stack for organizing information according to a single criterion. This is how the diary that R. H. Dana kept for his great book *Two Years before the Mast* might have looked if he'd written it in HyperCard.

dotted horizontal line in the field shows the text baseline. Leave a little space below it for descenders. The field width isn't critical.

5. Use the New Field command again to create the field for diary entries. Double-click the new field to open the Field Info dialog box. In it, name the field anything you like, and set the Style option to Scrolling. Click the Font button to set the field's text font, size, and style. Then click OK. Drag the field up to position it just below the date field, and then drag the bottom-right corner of the field down and to the right so the field takes up most of the card. Choose Background again from the Edit menu to bring back the foreground layer.

6. Choose the Browse tool (the pointing finger) from the Tools menu, and you have a functional diary with one card. Press the Tab key to select the date field, and type in the date of your first diary entry. Press Tab again to select the next field, and type in the diary entry. To create a new card for another entry, choose New Card from the Edit menu. You can go to other cards in the diary—or to the Home card—by using the Go menu. To sort the cards chronologically, choose Message from the Go menu to open the message box. In it type this command, and press Return:

```
sort ascending dateTime by field "Date"
```

This command does not correctly sort dates earlier than 1904 unless you use HyperCard 2.0 or a later version.

You could embellish this stack by adding buttons from the Button Ideas stack for moving forward and backward through the cards. You could also create a new button whose script sorts the cards so you don't have to type in the command above each time. "Diary Stack" shows how this stack might look.

(continues)

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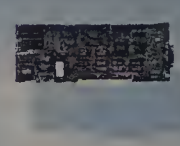

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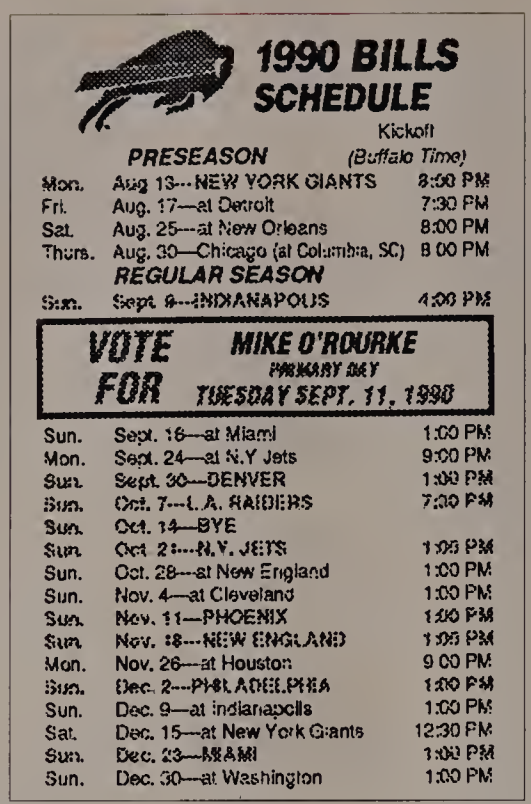
1990 BILLS SCHEDULE

		Kickoff (Buffalo Time)
	PRESEASON	
Mon.	Aug 13—NEW YORK GIANTS	8:00 PM
Fri.	Aug. 17—at Detroit	7:30 PM
Sat.	Aug. 25—at New Orleans	8:00 PM
Thurs.	Aug. 30—Chicago (at Columbia, SC)	8:00 PM
	REGULAR SEASON	
Sun.	Sept. 9—INDIANAPOLIS	4:00 PM

VOTE FOR MIKE O'ROURKE PRIMARY DAY TUESDAY SEPT. 11, 1990

Sun.	Sept. 16—at Miami	1:00 PM
Mon.	Sept. 24—at N.Y Jets	9:00 PM
Sun.	Sept. 30—DENVER	1:00 PM
Sun.	Oct. 7—L.A. RAIDERS	7:30 PM
Sun.	Oct. 14—BYE	
Sun.	Oct. 21—N.Y. JETS	1:00 PM
Sun.	Oct. 28—at New England	1:00 PM
Sun.	Nov. 4—at Cleveland	1:00 PM
Sun.	Nov. 11—PHOENIX	1:00 PM
Sun.	Nov. 18—NEW ENGLAND	1:00 PM
Mon.	Nov. 26—at Houston	9:00 PM
Sun.	Dec. 2—PHILADELPHIA	1:00 PM
Sun.	Dec. 9—at Indianapolis	1:00 PM
Sat.	Dec. 15—at New York Giants	12:30 PM
Sun.	Dec. 23—MIAMI	1:00 PM
Sun.	Dec. 30—at Washington	1:00 PM



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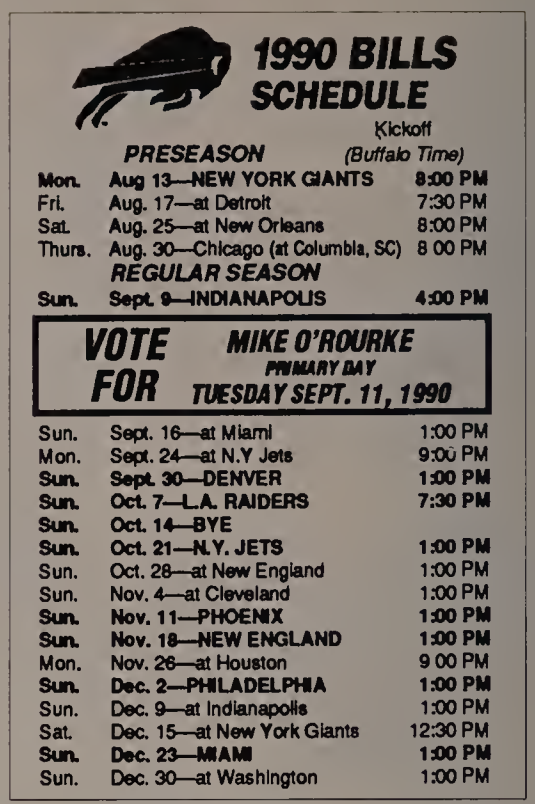

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Sun.	Dec. 23—MIAMI	1:00 PM
Sun.	Dec. 30—at Washington	1:00 PM

COARSE TEXT Color text (left) can be hard to read when reproduced as shades of gray in a composite proof (center). Raising the halftone screen frequency causes all shades of gray to print black for easier reading (right).

source specifies the number of monitors connected to the system. Following that is a set of information for each monitor. Scroll down to find the information for a monitor you want to disable. You can identify monitors by their screen sizes or by their NuBus slot numbers—higher numbers are further from the power supply. Scroll a bit more until you see the Is Active option for that monitor, as shown in "Disabled Monitor." Setting that option to 0 disables the monitor, and setting it to 1 enables the monitor. After making changes, quit ResEdit, clicking on Yes when the program asks if you want to save changes.

Copy the original System file to a backup disk. Remove the original System file from the System Folder and replace it with the modified System file (which must be renamed *System*). Then restart the Mac. When you want to reactivate the deactivated monitor, exchange the two System files and restart the Mac.

Rajiv Manglani
Brooklyn, New York

Proofing Spot Color

TIP: Spot-color text can be hard to read on a black-and-white composite proof printed on a LaserWriter because the printer software reproduces colors as shades of gray. This is fine for checking color breaks but makes text hard to read (see "Coarse Text"). The QuarkXPress Print command offers the option of printing colors as black and white instead of grays, but this option has no effect on color EPS files placed on the page. The simple solution: specify a halftone screen frequency too high for the printer to reproduce, for example, 150 lpi for a LaserWriter. This method will turn almost every percentage tint in a document to solid black, so it will not work in situations where there are background tints, process colors, or tint builds. In QuarkXPress, you change the screen frequency by setting the Halftone Screen option of the Page Setup command (File menu).

Changing the screen frequency is more involved in PageMaker. You must open and edit the APD (Adobe Printer Description) file for the appropriate printer with a word processor. Search for the word *DefaultScreenFreq,* and change the number that follows it in quotation marks to the new screen frequency (change 60 to 150 for a LaserWriter). Then search for the word *ScreenFreq,* and in the quotation marks that follow it, insert the new screen frequency (150 for a LaserWriter). Use the Save As command to save the altered APD file as a plain text file under a new name, such as LW IINTX composite.apd, so the original APD remains unchanged. Now to print colors in black, you select the altered APD file by name using PageMaker's Print command (File menu).

Stephen R. Zenger
Buffalo, New York

You can also print colors in black and white from PageMaker by using the Apple LaserWriter driver software (version 6.0 or later) instead of the Aldus APD. You press the Option key while pulling down PageMaker's File menu and choosing Print. You'll see three dialog boxes in sequence, including the standard Page Setup and Print dialog boxes. In the third dialog box you see (the standard Print dialog box), select the Black & White option. However, this method doesn't affect color or gray-scale text within placed EPS graphics. ■

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Lon Poole answers readers' questions and selects their tips for this monthly column. You'll find all the best tips from six years of this column in his latest book, Amazing Mac Facts *(Microsoft Press, 1991).*

Why the power protection unit on the left is more expensive than the one on the right.

As you can see, the surge suppressor on the left costs a few hundred dollars less than the APC Uninterruptible Power Source (UPS) on the right. What you don't see is that it could end up costing you and your business thousands of dollars in hidden and unnecessary expenses. That's because surge suppressors protect against a disturbingly low percentage of total power disturbances.

According to Bell Labs, surges represent only 8% of the power problems that affect computers. What's more, the sags, brownouts and blackouts that make up the other 92% can be just as damaging to the hardware and software of your Macintosh as that first 8% – resulting in costly data loss, system downtime, and service costs.

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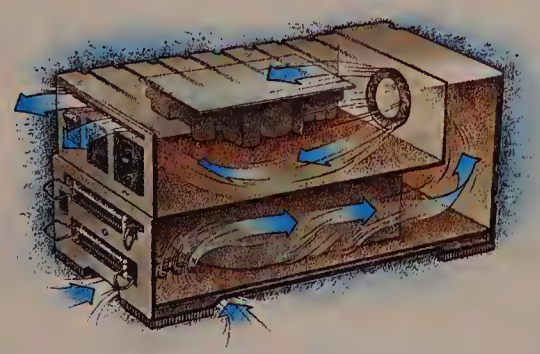

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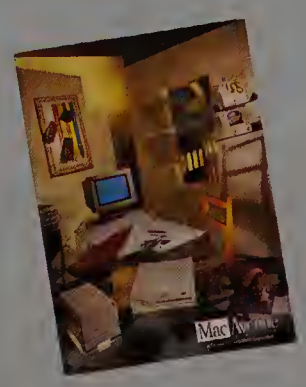

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Getting Started with Power Protection

How to be sure the Mac gets a steady supply of power

BY JIM HEID

Anyone who has watched an hour's worth of unsaved work vanish into the black hole of a darkened screen knows how traumatic a power failure can be. One minute you're hard at work, and the next you're staring stupefied at a blank piece of glass. Mac Lesson Number One: The power to be your best only exists when there's power.

But of all the power problems that can occur, power failures constitute a relatively small percentage. A variety of gremlins lurk on the other side of a wall outlet, and some of them can turn a Mac's lights out for good. This month, we'll look at the kinds of mishaps you might encounter, and we'll see just how susceptible your system is to them. Finally, I'll describe some add-ons that ensure the Mac a healthy flow of juice.

Current Events

The electricity that powers the Mac's chips, video tube, and other components is quite different from the current you get from a wall outlet. Most of the Mac's electronic components require small amounts of voltage—between 5 and 12 volts—but a wall outlet supplies roughly 120 volts (in the United States and Canada, that is; in Europe, 220 or 240 volts is standard, and elsewhere you may find either 120- or 220-volt systems).

What's more, the Mac's components require *direct current* (DC), while a wall outlet supplies *alternating current* (AC). DC travels continuously, while AC reverses its direction at regular intervals—generally, 60 times per second with 120-volt systems and 50 times per second with 220-volt systems.

All Macs contain a *power supply* that turns AC voltage from the wall outlet into direct current at the voltage levels needed by the Mac's components. The power supply also contains filtering circuits that smooth variations in the original current.

It's those variations that can cause problems. The electricity a power company supplies may seem like pretty consistent stuff, but it isn't. Its voltage fluctuates—sometimes dramatically—and it's prone to various types of *noise,* or interference. "Power Problems" illustrates the most common types of power flaws:

- *Outages,* or *blackouts,* occur when the power goes out completely. An overloaded circuit can cause a localized blackout in part of a house or building, while storms and downed power lines usually cause prolonged, area-wide outages. Momentary blackouts can also occur when a utility company switches between various power-distribution circuits while isolating a problem in the lines. Although such blackouts usually last only a fraction of a second, they can go on for several seconds (on the rural northern California coast where I live, longer ones are more common).

- *Sags* occur when the voltage available at the wall outlet drops below roughly 105 volts. Also called *brownouts,* sags can occur when a

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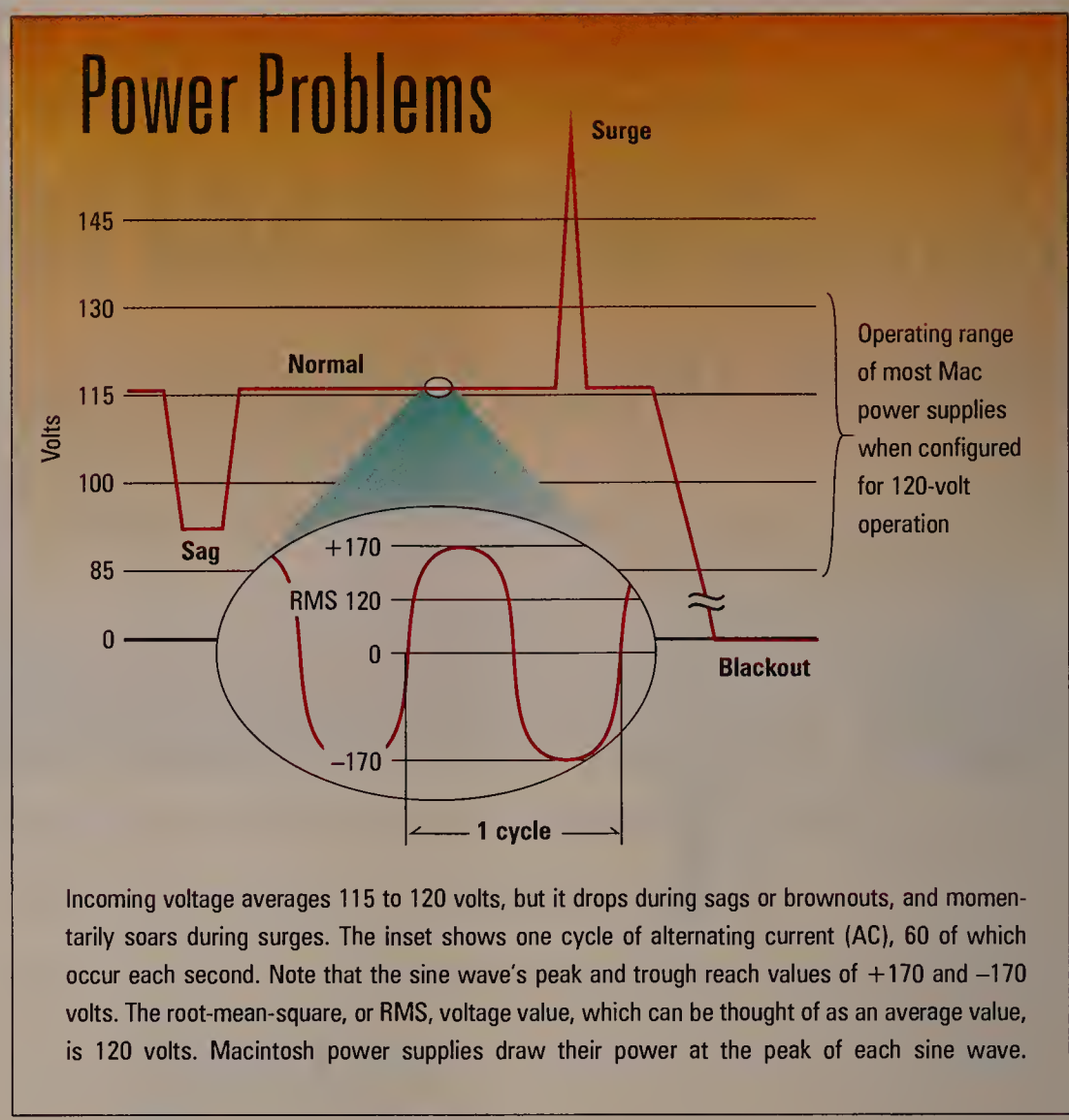

Incoming voltage averages 115 to 120 volts, but it drops during sags or brownouts, and momentarily soars during surges. The inset shows one cycle of alternating current (AC), 60 of which occur each second. Note that the sine wave's peak and trough reach values of +170 and –170 volts. The root-mean-square, or RMS, voltage value, which can be thought of as an average value, is 120 volts. Macintosh power supplies draw their power at the peak of each sine wave.

sudden load is placed on a circuit—such as when an air conditioner or some other power glutton is turned on. Sags can also occur when an electric utility company lowers the voltage in order to reduce demands on its generating equipment during periods of peak usage, such as sweltering summer days and frigid winter nights. Sags generally won't damage the Mac, although a very large one could cause a system error.

- *Surges* occur when incoming voltage increases by astronomical amounts for a very brief period (on the order of a few milliseconds, or thousandths of a second). Surges, also called *transients* or *spikes,* can occur when lightning strikes in your vicinity or when the power comes back on after a blackout. Small surges (under 1000 volts) can be caused by the electric motor in a refrigerator or other appliance turning off and are more common than large surges (1000 volts or more). A large surge can damage anything that's connected to the circuit; a small one generally won't cause permanent damage but could produce a system error and some lost work. Surges as a whole are less common than sags.
- *Noise* covers a range of flaws that affect the quality, not the quantity, of power present. A large electric motor can transmit noise into wiring that can interfere with radio or television equipment on the same circuit. This kind of noise, called *electromagnetic interference* (EMI), generally doesn't affect computer equipment.

The First Line of Defense

How vulnerable is the Mac to blackouts, sags, and surges? Judging from the number of *power conditioning* products available—and by the alarmist advertising some manufacturers use—you might think it's a sitting duck, ready to be humbled by the first surge or sag that comes down the wire.

Not so. The power supplies in the Mac family are designed with sags and surges in mind. Apple's power supplies are designed to work with as little as 85 volts, so the Mac shouldn't blink during brownouts.

Mac power supplies can even provide enough juice to keep the machine running during a very brief blackout, the kind caused when utilities switch distribution networks. Apple's power supplies are designed to provide 20 milliseconds of current to a Mac running at *full load*—all floppy and hard drive motors on, keyboard and mouse in use, all expansion slots filled, the processor hard at work, and all rear-panel connectors in use at the same time. Because a Mac rarely operates at full load, the power supply can carry you through an outage of a second or two—depending on what's connected to your Mac and how it's being used when the outage occurs.

All Macs are designed to withstand surges of up to 5000 volts. Indeed, the power supplies in most computer equipment have at least some surge protection built in.

So the Mac's power supply tolerates low-voltage conditions and stands up to surges. Why, then, does an entire industry revolve around power protection? For one thing, no power supply provides enough juice to span an outage lasting more than a couple of seconds. Also, surge resistance varies from one piece of equipment to the next; your Mac may withstand a surge, but will your modem, external hard drive, monitor, and scanner? And many power-protection devices offer convenient features, such as a single switch that turns everything on and off, or separate front-panel switches for each item plugged in to the device. Finally, there's the chicken-soup factor—a second stage of power filtering and surge protection can't hurt, and it may well help.

Suppressing the Urge to Surge

The most popular power-protection device is the *surge suppressor,* which you install between the wall outlet and your computer gear. It reduces incoming surges to innocuous voltage levels. Surge suppressors don't help when the power sags, but they are the least-expensive power protectors.

When shopping for a surge suppressor, you'll face a barrage of jargon and a variety of features, some convenient, some essential. In the jargon department, the two most important specifications are *clamping voltage* and *response time.* The clamping voltage is the point at which the surge suppressor kicks in and starts suppressing; voltages below the clamping voltage are sent along to the equipment. Thus, the lower the clamping voltage, the better; a 340- to 400-volt clamping voltage is best.

Response time is the time required for the surge suppressor to close its electronic gate and prevent the surge from getting through. The faster the response time, the better, since it means less of the surge sneaks through to the computer. Look for a response time of about 10 nanoseconds or less.

You may also see an *energy dissipation* specification. This refers to how much juice the surge suppressor's circuitry can absorb before it fails and simply passes the surge on to ground, an event that won't harm your equipment but will blow out the surge suppressor. Energy dissipation is measured in joules; the higher the value, the more durable the surge suppressor. Inexpensive surge suppressors generally absorb about 50 joules, while heavy-duty suppressors can absorb 300 or more joules.

The easiest way to choose a good surge suppressor is to make sure it meets Underwriters Laboratory (UL) specification 1449. (UL 1449 refers to a battery of torture tests, themselves described in another cleverly named document, IEEE 587.) A suppressor that complies with IEEE 587 is desirable, but the UL 1449 designation is preferable, since it means an independent laboratory, not the suppressor manufacturer, tested the device. It isn't enough for a suppressor to simply be UL listed; look specifically for the UL 1449 designation.

Beyond tech specs, here are other factors you'll want to consider:

- *Connections between hot, neutral, and ground.* Inexpensive surge suppressors (in the $10 to $20 range) protect only between the hot (current-carrying) and the neutral wires of a wall outlet. For complete protection, you also need protection between the neutral wire and the ground wire (the round hole below the two rectangular ones on a wall outlet) and between hot and ground

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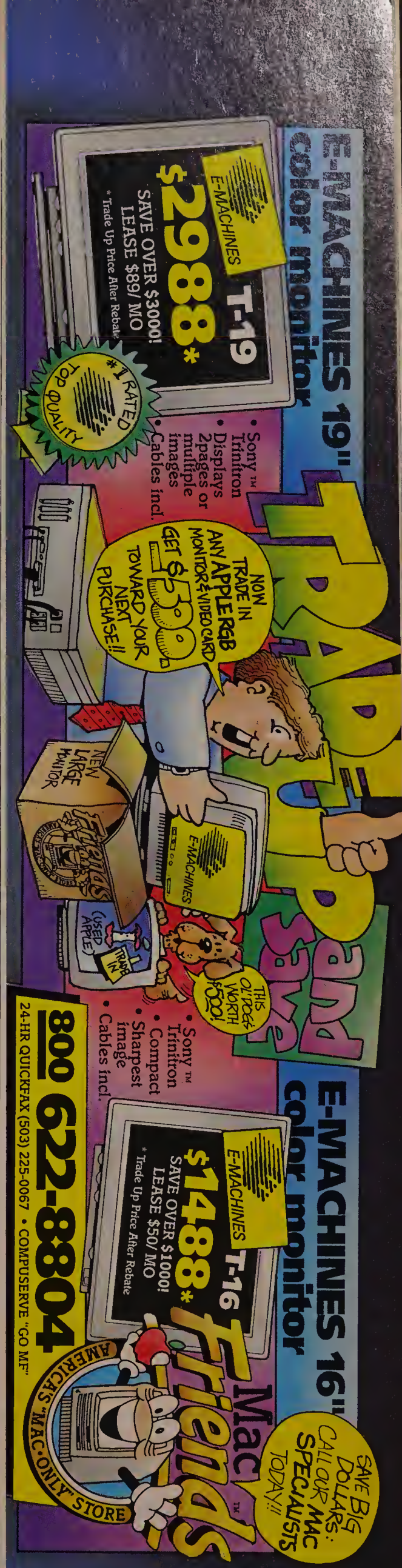

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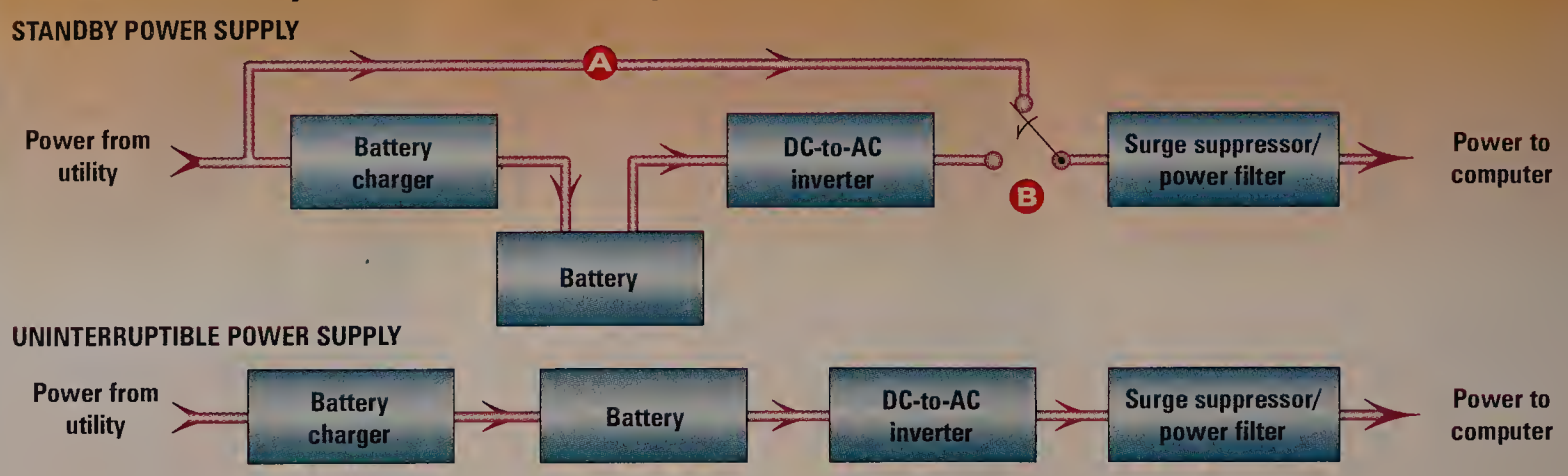
How Standby and Uninterruptible Power Supplies Work



In a standby power supply (top), the computer normally runs off incoming AC power **(A)**. When the power level drops below a certain voltage (usually 100 to 105 volts), a relay **(B)** switches power to the standby supply's circuitry, which comprises a bank of batteries and an inverter that converts the batteries' DC voltage to AC. With a true uninterruptible power supply (bottom), the computer always runs off the batteries, which are kept recharged. Such supplies have no real advantage over standby supplies, since the Mac's power supply can provide more than enough current to span the several milliseconds that elapse before the standby supply switches to battery power.

wires. This scheme is often described as providing "three-way" protection.

- *Modem protection.* A lightning-induced surge can enter the phone lines and fry a modem. Some suppressors provide jacks for a modem or fax machine, a desirable feature for lightning-prone areas. Another UL designation, UL 497A, indicates that a suppressor can successfully protect such communications equipment.
- *Number of outlets.* Most surge suppressors provide several outlets, and must also provide a master power switch. Some also provide individual switches for each outlet. Some suppressors, such as Curtis Manufacturing Company's Curtis Command Center, are designed to sit beneath a monitor, providing a swivel base for it, and they have a power switch for each outlet.
- *Failure alarm.* A surge suppressor can fail after absorbing too large a surge; better units provide an alarm that indicates when the suppressor circuit has failed. An alarm might consist of an indicator light (handy if the suppressor is close to your system), an audible buzzer (good if the suppressor is under your desk, out of eyeshot), or both (best).

Complete Power Protectors

For protection against sags and brief blackouts as well as surges, you'll want a *standby power supply,* which installs between your equipment and the wall outlet and contains batteries that provide from 5 to 30 minutes of power. That's more than enough power to span a brief outage or give you time to save and shut down during longer ones.

A standby power supply is often called an *uninterruptible power supply* (UPS), but in fact there's a difference between the two. With a UPS, computer equipment runs continuously from the power supply's batteries, which are constantly being recharged. By contrast, a standby power supply's batteries don't kick in until the power goes off (see "How Standby and Uninterruptible Power Supplies Work"). A standby power supply generally costs less than a true UPS and is just as reliable. A standby supply kicks in within milliseconds of an outage or sag, and as I mentioned earlier, the power supplies in your hardware will continue to provide power during that period.

The amount of power a standby supply can provide depends on what's connected to it. The greater the load on the supply, the faster its batteries will discharge. What's more, if you exceed a standby supply's current rating, you'll eventually blow a fuse in the supply. (Better-quality supplies have overload indicators that light when you're drawing too much current.) Thus, it's important to match the supply to your hardware.

Standby and uninterruptible power supplies are usually rated in *volt-amps.* A unit rated at approximately 100 volt-amps will power a typical Mac Plus or SE with a hard drive for at least 15 minutes (see "Current Requirements"). Such supplies generally cost between $200 and $400. For a Mac II–class machine with a 13-inch color monitor, you need a supply that provides 300 to 400 volt-amps, at a cost of $400 to $500. For a 19-inch monitor, make that at least 400 to 500 volt-amps and $500 to $700. Add another 100 volt-amps to include an external hard drive or tape backup device.

Don't bother providing standby power to your laser printer—you'd need a supply rated at 1000 volt-amps or more, and they cost between $1000 and $2000. And given the fact that you won't lose any work if the laser printer loses power anyway, it makes more sense to simply protect the printer from surges.

Shopping for Standby Power

Many of the shopping considerations behind surge suppressors apply to standby power supplies too. Some supplies provide only one rear-panel outlet; others provide several. Some

CURRENT REQUIREMENTS

Computer/peripheral	Power Consumption (volt-amps)
Macintosh Plus	75
Macintosh SE (no internal hard drive)	65
Macintosh SE (with internal hard drive)	80
Macintosh IIcx	120
Macintosh IIci	130
Macintosh IIx	150
Macintosh IIfx	180
13-inch color monitor	80
Full-page monochrome	80–90
Two-page monochrome monitor	130–170
Typical external hard drive	30–70
Typical laser printer	950

(such as American Power Conversion's UPS 110SE and UPS 370ci) can sit beneath a Mac or a monitor, while others (such as Emerson Electric Company's Accupower Micro UPS series and Kensington Microware's Power Backer series) are designed to sit on the floor. The better ones have several indicator lights that warn you when you're overloading the supply, when your electrical wiring is faulty, and when you're running on battery power.

More-sophisticated supplies provide an interface connector that lets you attach the supply to the Mac's modem or printer port so that the supply can convey status information to the Mac. Such a feature is most useful when you want standby power for a network file server.

If you want standby power for an AppleShare network file server, consider pairing American Power Conversion's UPS 110SE or UPS 370ci with the company's PowerChute software. These well-designed supplies provide interface connectors that can attach to the server Mac's modem port. The PowerChute software monitors the status information; when the power fails and the power supply kicks in, PowerChute sends a warning to all Macs connected to the server telling them how long the server will remain available. If the power doesn't return

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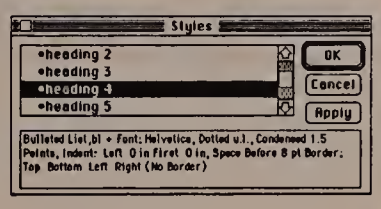

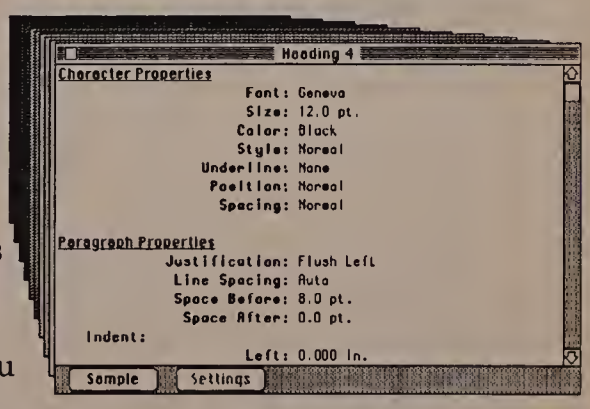

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Computer Accessories Corporation	619/457-5500	Numerous models; ProLine is UL 1449 rated; Proxima Power Director series has multiple power switches; Proxima Power Director Plus protects modem. $49.95–$159.95.
Curtis Manufacturing	603/532-4123	Numerous models, all UL 1449 rated. $6.95–$149.95.
Intermatic	312/282-7300, 815/675-2321	Electra-Guard series UL 1449 rated. Numerous models, some with modem protection and front-panel switches. $89.95–$159.95.
Kensington Microware	212/475-5200, 800/535-4242	Numerous models; MasterPiece Mac II also protects modem and has monitor swivel and multiple front-panel power switches. $29.95–$159.95.
Practical Solutions	602/322-6100	Strip Switch enables SEs to be turned on using keyboard power-on key. $89.95.
STANDBY AND UNINTERRUPTIBLE POWER SUPPLIES		
American Power Conversion	401/789-5735, 800/541-8896	UPS 110SE and UPS 370ci provide 110 and 370 volt-amps, UPS 110SE $299, UPS 370ci $499; several less sophisticated models available. PowerChute software for AppleShare servers, $99.
CMS Enhancements	714/222-6000	UltraPower series provides 450–1500 volt-amps. UltraPower 800 and 1000 produce square wave output;others produce sine wave. $699–$2199.
Computer Accessories Corporation	619/457-5500, 800/582-2580	Proxima IPS 500+ fits under Mac II monitor and provides 400 volt-amps. $649.95.
Cuesta Systems Corporation	805/541-4160, 800/332-3440	DataSaver series provides 110–750 volt-amps. $495–$695.
Emerson Electric	714/380-1005	Accupower Micro UPS series provides 150–1400 volt-amps. $189–$998.
General Power Corporation	714/956-9321, 800/854-3469	Heavy-duty Unistar series provides 1000–10,000 volt-amps. $2795–$14,025.
Kensington Microware	212/475-5200, 800/535-4242	Power Backer series provides between 360 and 1200 volt-amps. $399–$1399.
Para Systems	214/446-7363, 800/238-7272	MM 1600SS provides 1600 volt-amps. $1999.

before the standby power is exhausted, all users are safely logged off the server, which is then shut down normally. Of course, only users who weren't victimized by the outage—or who have their own standby power supplies—will see the on-screen warning message, but the warning is only half the value of PowerChute anyway. What's equally important is that the server is safely shut down for you.

Before buying any standby power supply, make sure it provides either *sine wave* or *stepped-square wave* output. Inexpensive standby supplies often provide *square wave* output, which causes considerable electrical stress to monitors and hard drives that could make them wear out faster. Sine-wave output is the most desirable, since that's what wall outlets normally supply.

Finally, be aware that after several years, you'll need to replace your standby power supply's batteries, which can cost up to 30 percent of the supply's original price. You may want to investigate replacement costs before picking a unit.

Standby power supplies provide more complete protection than surge suppressors but are far less popular. One reason is their cost; another is that they provide only a brief reprieve from darkness. Still, if your power is as unreliable as mine, that reprieve can be priceless. The glow of a Mac screen in an otherwise darkened room is a heartening sight—especially if you haven't saved recently.

More Power Tips

"Power Protectors" lists vendors of surge suppressors and standby power supplies. But neither device will help if your electrical wiring is faulty. Be sure your wall outlets' third-wire ground holes are connected to a good earth ground. (Check the point where the electrical service enters your house; you should find a copper rod driven into the ground with a heavy wire connecting it to your wiring.) Also be sure that your hot and neutral lines are wired properly. You can check them yourself using an inexpensive *line checker* such as Radio Shack's catalog number 22-101. (American Power Conversion's standby supplies contain line-checking features.) To be extra sure, however, double-check with an electrician or your local utility company.

Also, avoid ground eliminators—those little adapters that let you plug a three-pronged power cord into the two-conductor outlets many older buildings have. Defeating the ground conductor makes the Mac more susceptible to power surges. Have an electrician install a properly grounded, three-conductor outlet.

The best way to protect equipment against lightning-induced power surges is to unplug the Mac and everything connected to it during a lightning storm. (Don't forget to unplug the modem from the telephone lines.) A lightning bolt is the ultimate surge; don't count on a surge suppressor to protect you from it.

In the end, one of the best ways to avoid losing work because of power problems is free. Simply follow the advice that Fred Parker, a power-supply veteran at Apple, passed along to me: Save often. ■

See *Where to Buy* under Power Protectors for contact information.

Contributing editor Jim Heid focuses on a different aspect of Mac fundamentals each month. He is currently working on a complete guide to the Macintosh, to be published this year by IDG Books Worldwide.

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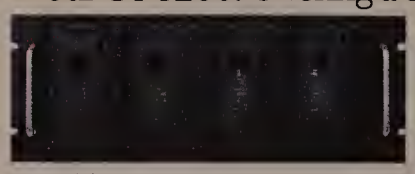

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Insights on QuarkXPress 3.0

TIPS FOR A SUPER-POWER PUBLISHING TOOL

BY DIANE BURNS

QuarkXPress has had a reputation for being a powerful, yet difficult package. The release of 3.0, however, eliminated most of the quirks responsible for raising the frustration quotient. Plenty of new features have also been added, including a pasteboard, the ability to create spreads, and free rotation of text and graphics. Here are some of the most useful tricks and shortcuts.

The Measurements Palette

One of the new features that makes QuarkXPress 3.0 so easy to use is the Measurements palette, a long, narrow window that lets you interactively adjust specifications for text and graphics. Display the Measurements palette by selecting Show Measurements (View menu).

The content of the Measurements palette is determined by the type of item you have selected—selecting a text box, a picture box, a line, or a group of items changes the palette accordingly.

Click on any field in the palette to make an entry, or use the keyboard shortcut ⌘-Option-M to highlight the first field. You can then Tab forward to the next field, or Shift-Tab to highlight the previous field. To revert to original values in the Measurements palette, press ⌘-Z.

Document Setup and Navigation

The Document Layout palette is a powerful tool for setting up and navigating a document. Select Show Document Layout (View menu) to display the Document Layout palette, where master pages and document pages appear as small icons.

MARK JASIN

The Document palette is the only way to add new master pages (you can have up to 127 master pages in one document). Simply click on a single- or double-sided master-page icon at the top of the palette and drag it to the right. You can insert new pages in a document by dragging the appropriate master-page icon down into the document-page area. Add pages one at a time, or hold down the Option key before you drag the icon; the Insert Pages dialog box appears when you release the mouse button, allowing you to specify any number of pages to be added.

To change the starting page number of a document or section, first click on a document-page icon; the page number appears in the top area of the palette. Then click once on the page number to open the Section dialog box that allows you to change the numbering scheme.

The Document Layout palette offers one of the fastest ways to turn pages in a QuarkXPress document. You just double-click on the page icon to display that page on screen.

From the Keyboard

QuarkXPress supports a wide range of keyboard shortcuts, including a multitude of program-specific commands. Some of the most useful ones involve selecting tools and

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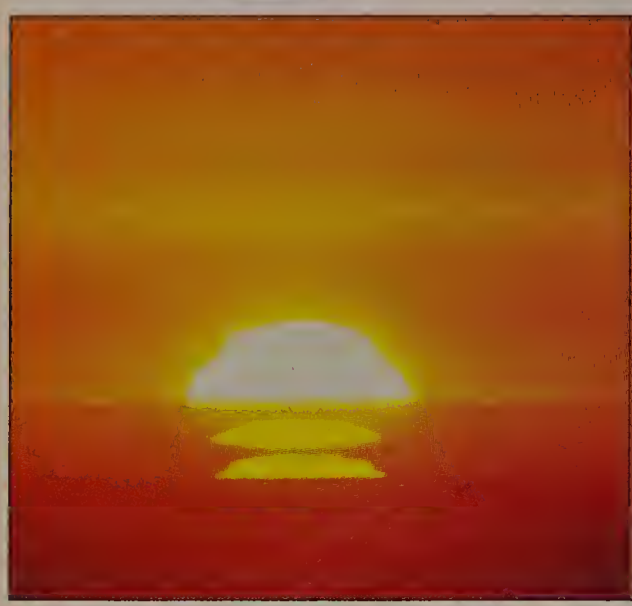
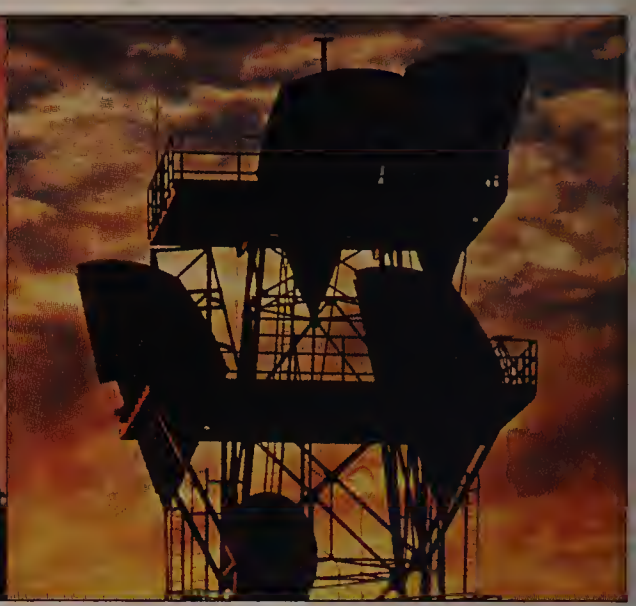
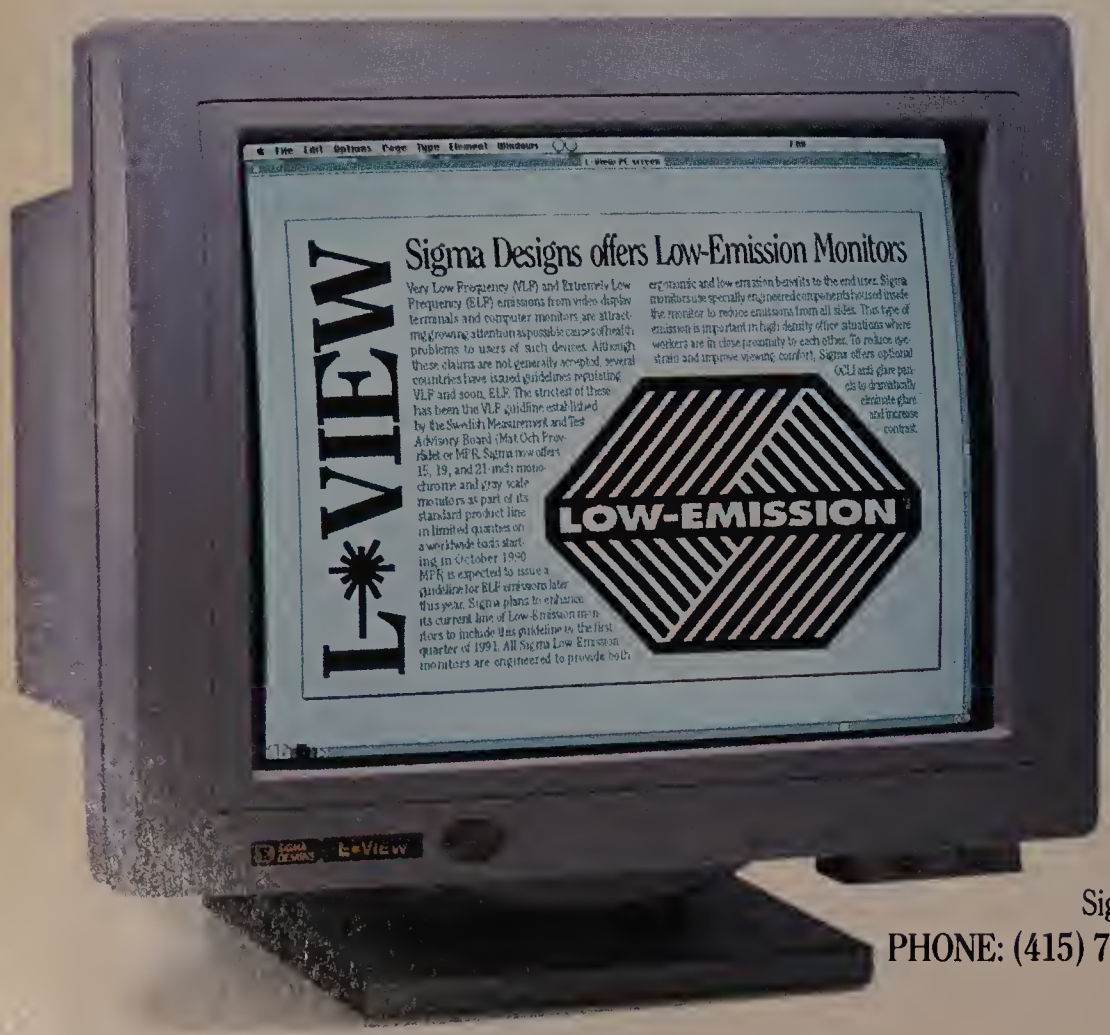
There are many sources of high radiation emissions.





This isn't one of them.



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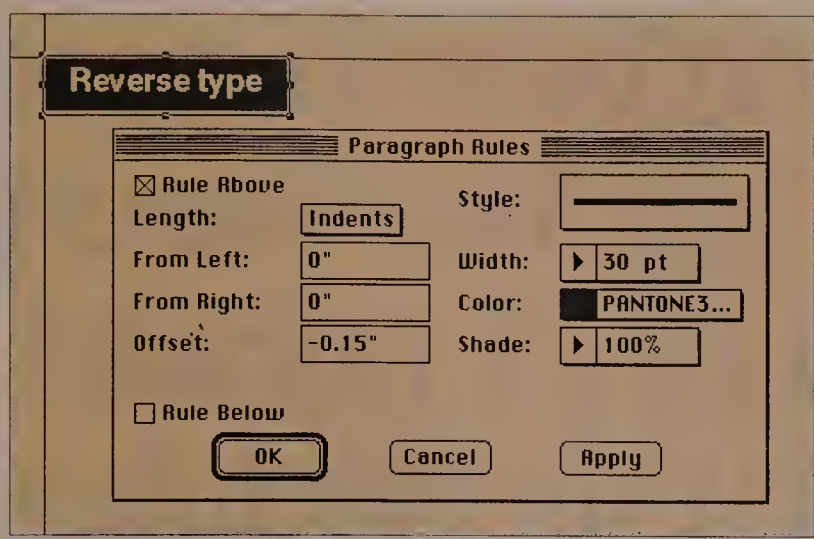
working with graphics (see "Tool-Selection Shortcuts" and "Graphics Shortcuts").



TYPE IN REVERSE You can use paragraph rules to create a box with reverse type that can be made part of a style sheet.

Reverse Type with Style

You can utilize QuarkXPress's Rules command, for placing rules above or below paragraphs, to create reverse type on a black (or any color or shade) rule. First apply a rule to text (which can also be any shade or color) by highlighting the text and selecting the Rules command from the Style menu. In the dialog box that appears, check Rule Above. Choose the color, shade, length, and width (up to 504 points) of the rule desired; then input a negative value in the Offset field. Since the default measurement unit for offset values displays as a percentage, be sure to enter the unit of measurement after you type in a value.

The nicest part of this feature is that you can set up the format described above via the Style Sheets command (Edit menu), thus making reverse type as simple as applying a style sheet(see "Type in Reverse").

Drop Caps the Easy Way

QuarkXPress now makes creating drop caps painless. Simply select Formats (Style menu) and in the Paragraph Formats dialog box that appears, click on Drop Caps, specifying the width (number of characters) and depth (number of lines) the drop cap should be. And since the drop cap is considered a paragraph format, it can be included as part of a style sheet.

This command allows a great deal of flexibility, including the ability to freely resize drop caps. There's even a way to create a hanging-indent drop cap. After you specify a drop cap, simply position the cursor to the right of the drop cap and enter the Indent Here character (⌘-\), which creates an automatic hanging indent.

The maximum depth you can specify for drop caps is 8 lines. If you need a drop cap that runs more than 8 lines deep next to or in a paragraph, make the drop cap an anchored text box within that paragraph.

Text Inside a Shape

You can use QuarkXPress's Runaround command to flow text inside any shape. Draw a picture box, and import a graphic that is roughly the shape you want the text to flow into. Select Runaround (Item menu) and set Mode to Manual Image, Text Outset to 0", and check Invert.

The graphic will have an editable runaround polygon shape around it. Press delete to remove the graphic from the picture box while leaving its runaround polygon behind. You can edit the runaround polygon by dragging its handles. You can add handles to the polygon by holding down the ⌘ key as you click on the polygon outline. To remove handles, hold down the ⌘ key as you click on a handle. To prevent screen redraw while editing the polygon, hold down the Space bar; when you release it, the screen will redraw.

To get text to flow within the polygon, position the picture box containing the polygon over the box containing your text (choose Bring to Front from the Item menu to make sure the picture box is in front of the text box). Also make sure the text is justified so that it completely fills the polygon. You can adjust the way text flows by editing the polygon shape and by modifying the text's word and character spacing.

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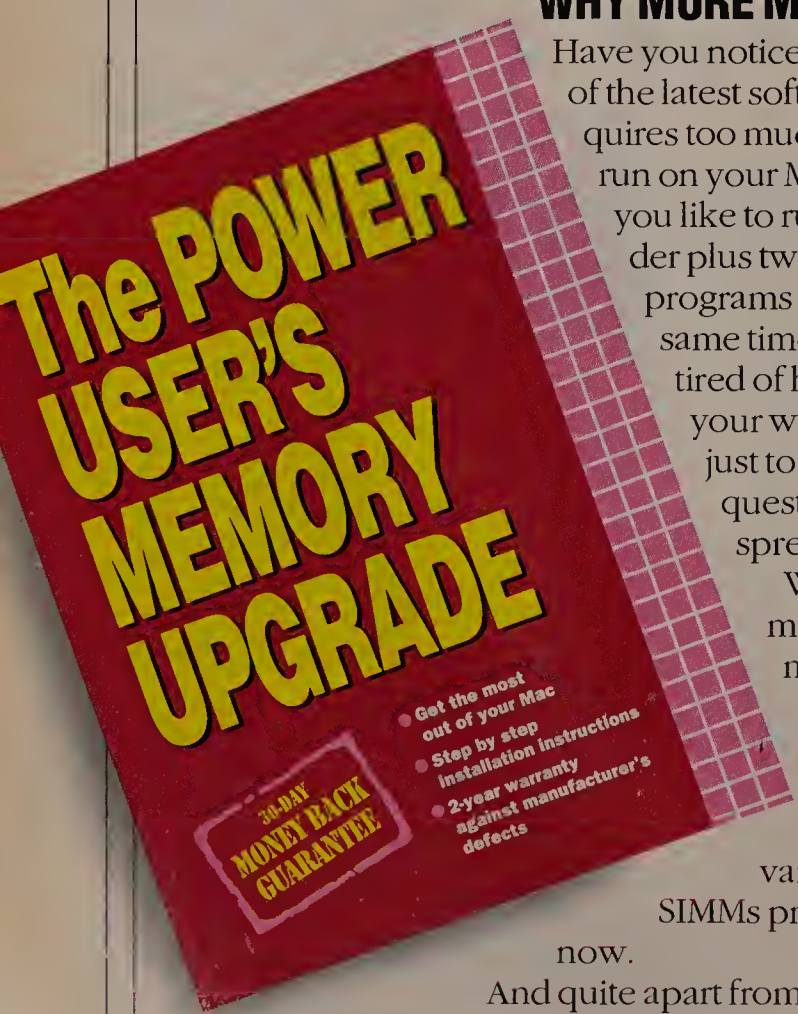
And a memory upgrade is easy to install yourself, in not much more than half an hour.

WHY MORE MEMORY?

Have you noticed that some of the latest software requires too much memory to run on your Mac? Would you like to run MultiFinder plus two or more programs — all at the same time? Are you tired of having to quit your word processor just to answer a question from a spreadsheet?

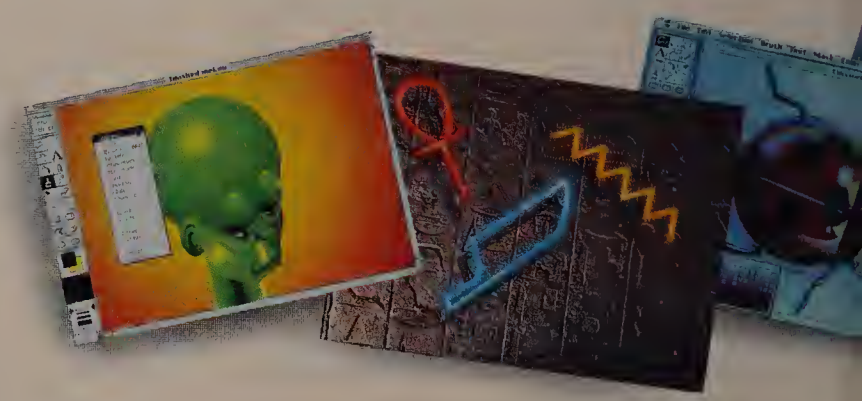
Well, added memory is a must! Join the thousands of Mac users who are taking advantage of low SIMMs prices right now.

And quite apart from the ability to do multi-tasking, added memory speeds up your disk access time and eliminates delay when selecting menu items.



WHAT DO I NEED?

It couldn't be simpler. Call and we'll help you select the right Memory Upgrade for *your* Mac. We'll rush it to you overnight for just $3. You'll find installation at home is easy when you use our "step-by-step" instruction manual. Or, order our new video, and watch

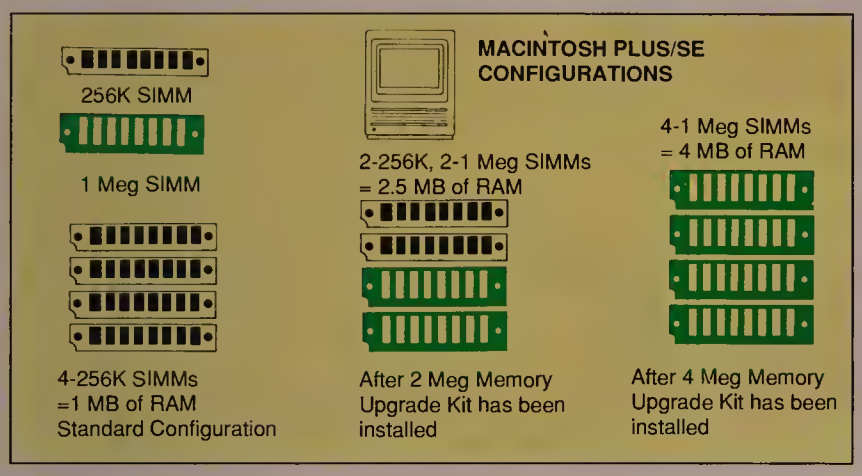


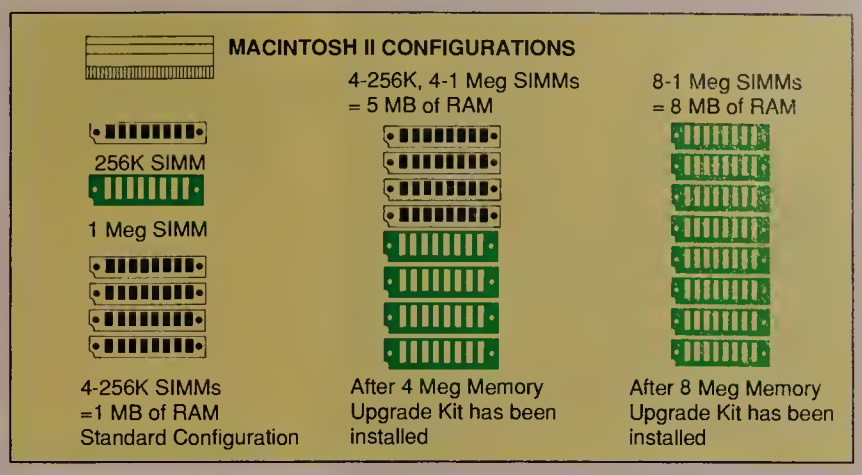
the process being done step-by-step. The video is free with the purchase of 2 or more SIMMs modules. ($29 if purchased separately.) The whole job should be completed in less than one hour. You'll need a simple tool kit, which is available for just $9.

If you prefer, you can have a computer store install your SIMMs for you. Their service technicians have the necessary tools and expertise. The total cost shouldn't exceed $50.

The Mac Plus and Mac SE have four available slots on the motherboard, which originally contain four 256K SIMMs modules — totalling 1 megabyte (1MB) of memory. To upgrade, you can replace each 256K module with a 1MB module, but you must do this in pairs.

Replace two 256K modules and you will have a total of 2.5MB of memory. (That's the two new 1MB modules plus the original two 256K modules.) Replace all four modules and you'll have 4MB. (You should save the 256K modules for later use if you want to pass your Mac on to someone else.)





The Mac II, IIx, IIcx and SE/30 each come with a total of eight slots. The standard configuration has four 256K SIMMs modules, or a total of 1MB. Here, memory must be upgraded in multiples of four. This allows for expansion from 1MB to 4MB, 5MB or 8MB.

Remove the four 256K modules and replace with 1MB modules and you have 4MB. Leave the original modules and add four 1MB modules and you get 5MB. Removing the original modules and adding eight new 1 MB modules will bring you to 8MB of memory.

FAST, FASTER, FASTEST

SIMMs come in different speeds and are calibrated in nanoseconds (ns) from 70ns to 120ns. Anything faster than 120ns doesn't much help any Mac but the IIci. The system doesn't respond any faster anyway. But you can always take your memory chips with you when you move on to a new Mac, so there may be an advantage to speed at a later date.

QUALITY CONTROL

MacWarehouse buyers and agents scour the world in search of top quality components for our SIMMs modules. They're supplied only by top grade manufacturers like Samsung, Siemens, Texas Instruments, Micron, Fujitsu, Intel, etc. Each unit is tested for performance, quality and noise, in temperatures from freezing to 158°F.

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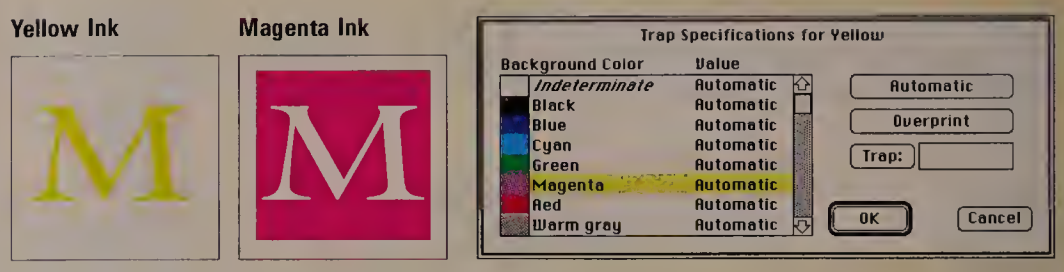
COLOR TRAPPING WITH QUARKXPRESS

Trapping is a technique for ensuring that when two adjacent colors are printed, they neither overlap excessively nor leave any white space between them that would allow the paper to show through. Many factors—such as the speed and accuracy of the press, the order in which inks are applied on the press, the absorbency of the paper, temperature, and humidity—must be considered in determining the type of trapping to be used.

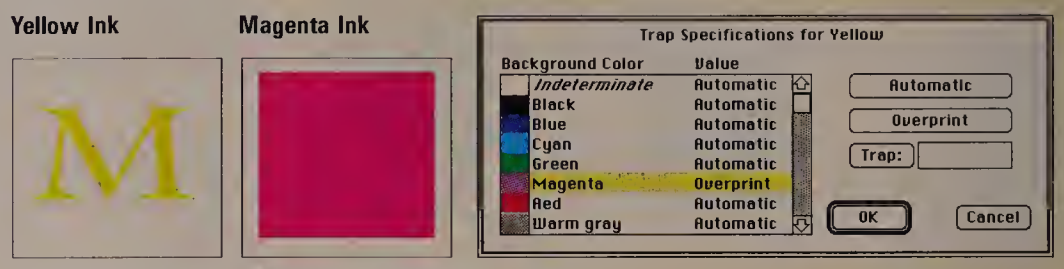
QuarkXPress 3.0 offers a new feature—the Edit Trap command—which lets you control the way in which two adjacent colors print in relation to each other. In QuarkXPress 3.0, trapping is specified by the way an *object* color traps against its *background* color. Object color is applied to characters or to an item that's in front of another color, while background color is applied to the item that is behind another color item.

First select Colors from the Edit menu. In the Colors dialog box, choose the object color for which you're specifying trapping values. Click on Edit Trap to display the Trap Specifications dialog box, which lists the trapping values specified for the object color (shown in the dialog box title) and each of the colors in the Background color column. The Value column lists the trapping value specified for each background color. A value can be specified in one of three ways.

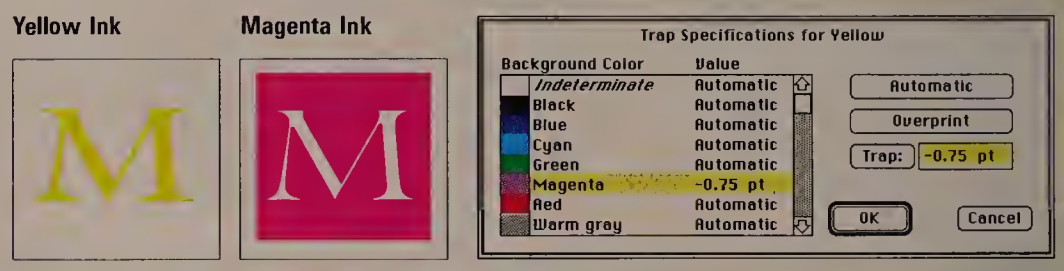
- *Automatic trapping* The object color *knocks out* the background color (this is the default setting in QuarkXPress). Version 3.0's conservative trapping method determines how much to *spread* (increase the size of) the object color or *choke* (reduce the knockout area of) the background color.
- *Overprint* The object color prints without knocking out the background color when you're printing color-separation plates. As a result, on an offset press the object color prints on top of the background color. QuarkXPress allows overprinting only when the overprinting color has a 95 percent or higher shade.



Trapping for Yellow on Magenta specified as Automatic.



Trapping for Yellow on Magenta specified as Overprint.



Trapping for Yellow on Magenta specified to choke .75 pt.

Trapping for Yellow on Magenta specified to spread .75 pt.

- *Trap* You enter a custom value (between –36 points and +36 points, in .001-point increments) for the trapping or overlap between the object color and the background color. Values are typically set very low, at about .25 of a point or less. After you enter a value, click on Trap to save the changes you've made. A negative value chokes the background color, a positive value spreads the object color against the background color. If you enter a value of zero, no choking or spreading occurs and the object is cut out from the background.

When an object is in front of more than one color, in front of certain color pictures, or if QuarkXPress is unable to identify the background color, the item traps to the setting you've specified for Indeterminate color.

Although each print job has different requirements, here are some general guidelines to follow. For spot-color printing of adjacent colors, you should generally set the lighter color to overlap the darker color—to compensate for the fact that darker inks cover lighter inks when they're printed. With process-color printing, trapping is most crucial when two colors have none of the four process colors—cyan, yellow, magenta, black—in common. If you're printing two adjacent colors that both contain some magenta, when magenta is printed the paper will not show through where the two colors meet unless the other colors are significantly off-register. If the colors share no cyan, magenta, yellow, or black ink, you may need to make some adjustments to avoid trapping problems.

GRAPHICS SHORTCUTS

To accomplish this	Hold down
Enlarge or reduce graphics in 5 percent increments	Shift-Option-⌘-> or <
Bring graphic to center of picture box	Shift-⌘-M
Fit a graphic inside a picture box, while maintaining aspect ratio	Shift-Option-⌘-F
Visually resize a graphic and its picture box while maintaining the aspect ratio of both	Shift-Option-⌘ while dragging corner handle of picture box

Special Font Shortcuts

You can change to the Symbol font or Zapf Dingbats for one character using a simple keyboard command. Press Shift-⌘-Q, and the next character you type will be in the Symbol font. After the one Symbol character, QuarkXPress returns to the font you were using. Use Shift-⌘-Z to make the next character you type Zapf Dingbats.

New-Line Character

Sometimes called a soft carriage return (press Shift-Return), the new-line character starts a new line without starting a new paragraph. Use this character instead of a paragraph return to break headlines that are longer than one line; as a new paragraph the second line would take on all the formatting associated with the headline—such as extra space above it, resulting in too much space between each line of the headline. Another good use for this feature is in creating tables. End each line with the new-line character to make the entire table one paragraph. Then you've got a table that's much easier to format, since you can set tabs and other formats by clicking just once anywhere in the table, rather than having to select the whole table.

You can search for new-line characters just as you would any other invisible characters in QuarkXPress—such as paragraph returns, tabs, or spaces. To enter the new-line character in the Find/Change dialog box, hold down the Shift and ⌘ keys and press Return. The characters \n appear in the dialog box.

Selecting, Spacing, Nudging, and Grouping

For working with items on the page, QuarkXPress 3.0 adds several commands and features that are more often found in drawing software than in page-layout programs. For example, you can select multiple items by surrounding them with a marquee (Shift-drag) or by Shift-clicking on each one. Once items are selected, you can use the Space/Align command (Item menu) to space or distribute them horizontally or vertically. You can also group the items (choose Group from the Item menu), which allows you to move or rotate them as a single unit. You can still perform many editing functions on any individual item within a group without ungrouping them first.

Use the arrow keys to nudge a selected item in 1-point increments; adding the Option key moves them in .1-point increments.

Using the Library

QuarkXPress 3.0's Library feature lets you store items in a separate QuarkXPress file, or Library, that holds up to 2000 individual items or groups of items. After creating a Library, you simply drag items from a document into the Library, where they show up in miniature. Drag an item out of the Library, and it appears on a document page. Applying labels to Library items makes it easy to display only those items you wish to view.

Although you cannot drag a page

(continues)

TOOL-SELECTION SHORTCUTS

To temporarily change from any tool to	Hold down
Item tool	⌘ key
Zoom tool (to zoom in)	Control
Zoom tool (to zoom out)	Control and Option

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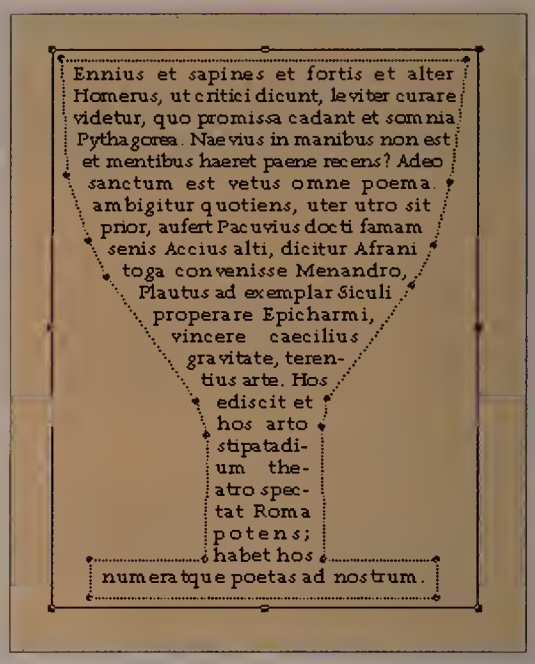


TEXT INSIDE A SHAPE Using the Runaround command, you can flow text into any shape by placing its picture box over a text box. As shown here, the text box should be slightly larger than the picture box so that it can be selected after the picture box is placed over it.

into a Library, you can select all the items on a page, including a master page, and drag them as a group into the Library. By using the Library, you can reuse the same master page for various documents, as an alternative to creating template files.

Use the Library to store items containing elements that cannot be applied by a style sheet, such as background colors or vertical alignment in text boxes. Store a text box with the correct background color and vertical alignment in the library, then drag it onto your document page as needed. Dummy text can contain character attributes and paragraph formats.

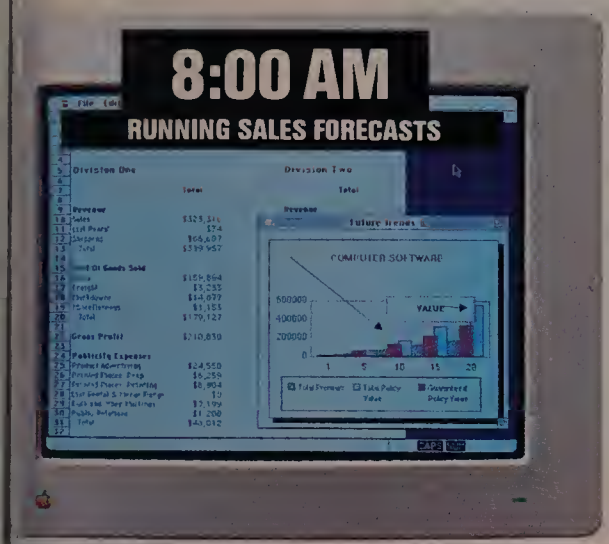
Sharing the Wealth

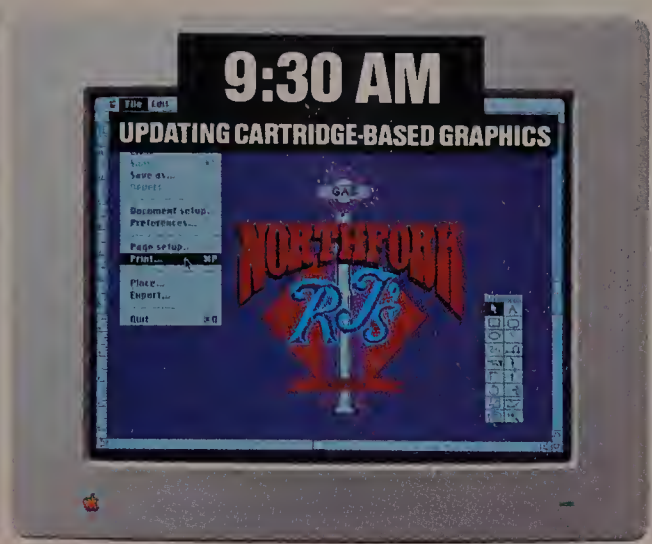
If you've found a tip or shortcut not mentioned here, spread the word to other *Macworld* readers by sending it to *Quick Tips, Macworld,* 501 Second St., San Francisco, CA 94107. ■

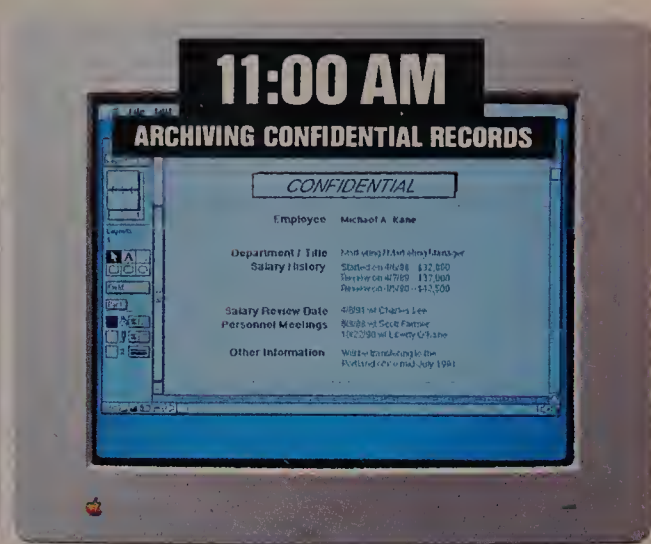
See *Where to Buy* for contact information.

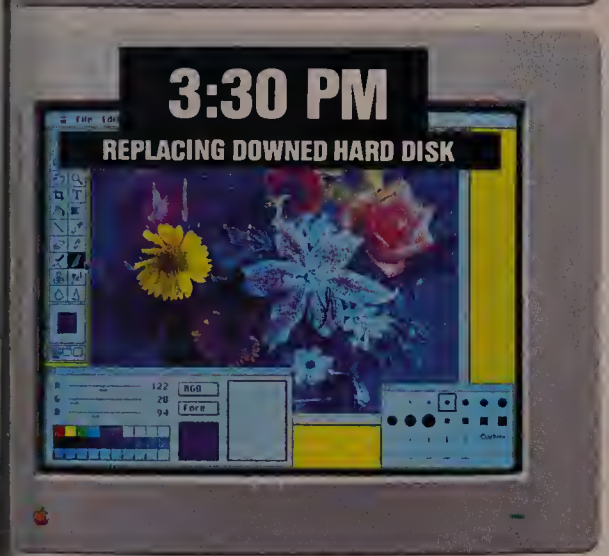
Diane Burns is president and cofounder of TechArt, a San Francisco–based graphic design firm that uses QuarkXPress and other Macintosh programs as everyday tools. She is coauthor of The Official QuarkXPress 3.0 Handbook *(Bantam, 1990).*

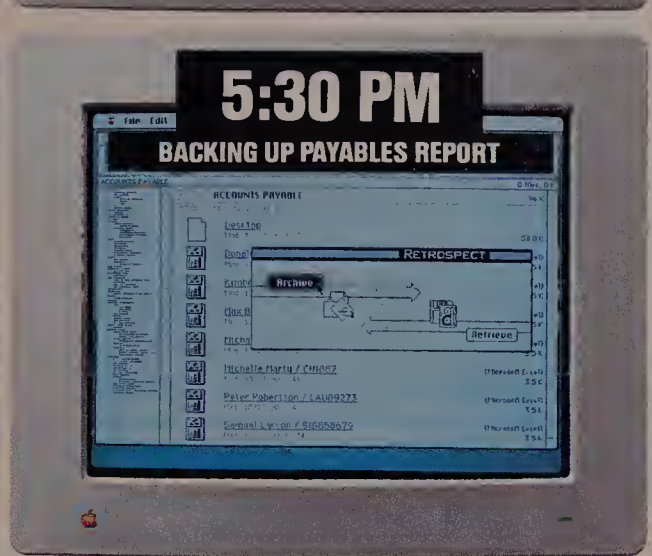
A Day In The Life Of











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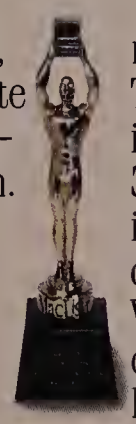

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iat Eurostile Oblique Stone Sans Dom Casual Fraktur
Kabel Helvetica Condensed Eras Light Freestyle
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Memphis Univers 47 Serifa Sonata
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Imagine being able to view an unlimited number of fonts *in their own typefaces* at any moment, picking and choosing among them without breaking stride. Imagine never having to search through a cluttered System File to find what you need.

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FIFTH GENERATION SYSTEMS

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UPDATES

Here's our list of some of the latest versions of Mac software that were announced at the time we went to press. We hope you'll find it useful—because these days, keeping track of the latest CPU is tough enough. The first price is the upgrade cost for registered owners; the second is the current list price.

AgfaType version 2.0 provides access to more than 1100 PostScript screen and printer fonts. Contains hundreds of new and original typefaces as well as the complete Adobe Type Library, including headline and display type. Agfa Compugraphic, 508/658-5600 ext. 2326. Free; $165 per font.

HandOff II version 1.1 has Desktop Manager support and increased speed; can be disabled while using some DAs that are more efficient when HandOff is not running. Software Innovations, 214/727-2329. Free; $79.95 new.

FileMaker Pro is now multiuser-compatible and runs on basic Mac networks, with or without a file server. Features record locking, multiple levels of password protection, and the ability to create confidential layouts. Layout mode lets you change font, size, and style character-by-character in each field; offers ovals, rounded rectangles, choice of line width, and pattern and shaded areas. Has 19 new text calculations to enable users to access and extract information by text location and content. New mathematical summary calculations include running total, running count, weighted average, fraction of total, and fraction of subtotal. Claris Corporation, 408/987-7000. Contact vendor for upgrade policy; $299 new.

PRODUCT UPDATES

Product	V.	Req.	Rev.	Price
1st Aid Kit ★	2.8	512KE/3.0		*
4th Dimension	2.1	1MB/6.02	3/90	Free
Aatrix CheckWriter II ★	2.01	512K/4.1		$10
Aatrix TimeCard	2.0	512K/4.2		Free
Accountant Inc., Pro	1.03	1MB/6.03	9/90	$19.95
ACCPAC Bedford Simply Accounting	1.1	1MB/5.1		$50
AccuText	2.0	4MB/6.02	2/90	*
Address Book	2.0	1MB/6.02	6/90	$25
Adobe Illustrator	3.0	2MB/6.03	2/91	*
Adobe Type Manager ★	2.0	1MB/6.02		Free
AdWriter	2.0	1MB/6.0		Free
After Dark	2.0	512KE/4.1	7/90	*
AgfaType	2.0	2MB/6.02		Free
Alchemy	1.1	1MB/6.0	10/90	$25
Aldus FreeHand	2.02	1MB/6.03		*
Aldus PageMaker	4.0	1MB/4.1	9/90	$150
Aldus Persuasion	2.0	1MB/6.0		*
AmPack Plus ★	4.2.2	512K/3.2		$29.95
Analog Connection WorkBench	3.0	1MB/5.0	5/90	$50
Anatool ★	3.1	512K/3.0		$35
AntiToxin	1.3	1MB/6.0.2		$15
Aperture	1.7	2MB/6.0.3	7/90	*
APL.68000	7.0	512K/3.2		*
AppleShare File Server	2.0	512K/3.2		*
ArchiText	2.0	1MB/6.02		Free
Aristotle's Politics	2.0	2MB/6.03		Free
The Art Importer	2.0	1MB/6.0	5/90	$20
ArtRoom	3.0	512K/3.2		$199
AutoCalc	2.0	1MB/6.0		$95
AutoSave II	1.1	512KE/4.2	7/90	$7.50
A/UX	2.0	4MB/6.0.5		*
Aztec C	3.6	512KE/4.2		*
BackFax ★	1.02	1MB/6.03		Free
Back to Basics: Professional	2.0	512K/3.2		$75
Bridge	6.0	512K/3.2		$17
Business FileVision ★	1.5	1MB/6.02		*
Business Sense ★	1.2	1MB/6.0		*
Business Session ★	3.2	512K/3.2		Free
CA-Cricket Presents	2.0.1	1MB/6.0		*
Calculator Construction Set ★	2.06	512K/3.2	4/90	$25
CanDpener	1.1	512K/3.0		Free
Canvas	2.1	1MB/6.0		*
Capture	3.0	1MB/6.0		$15
Central System Manager	2.1	1MB/5.0x		*
Chameleon	3.0	512K/3.2		Free
Chemintosh II		1MB/6.02		Free
ChromaScan	1.1	4MB/6.02		Free
Claris CAD	2.0	2MB/6.0		$79
Codecheck	2.0	1MB/6.0		Free
Colorset ★	1.5	1MB/6.0	6/90	Free
CompileIt	1.5	1MB/6.02	3/90	$30
CompuServe Navigator ★	2.1	512K/3.2		*
Computerized Classic Accounting	2.2	1MB/6.0		*
ConcertWare	5.1	512KE/4.2		$35
Control II	1.1	2MB/6.04		Free
CopyFlow	2.0	2MB/6.0	6/90	Free
Correct Grammar	2.0	1MB/4.2	9/90	$29.95
Cue	3.0	1MB/6.03		*
DacEasy Light Checkbook Accounting	2.0	1MB/6.03		*
Data Desk	3.0	512K/4.02	6/90	$125
DataMcrge	2.0	512K/3.2		Free
dBase Mac ★	1.01	1MB/4.1		Free
Deluxe Music Construction Set	2.5	512K/6.02		*
DeskPaint ★	3.0	1MB/4.2	5/90	Free
Developer Stack	3.0	1MB/6.0		$15
DiagramMaker ★	1.1	1MB/6.02		*
Digital Darkroom	1.1	1MB/6.02		Free
DiskDoubler	2.0	1MB/6.02		*
DiskExpress II	2.04	1MB/6.0	11/90	*
DiskFit	1.5	512K/4.1		$30
DiskTop	4.0	1MB/6.0		*
Display AdBuilder	1.1	1MB/6.03		*
DocuComp	1.5	512K/3.0	12/90	$19.95
Dollars and Sense	4.1	512KE/3.2		*
Double Helix	3.5	1MB/6.0		*
Dreams	1.1	1MB/6.02		*
DynaPerspective	2.0	2MB/6.04		Free
DynoDex ★	1.21	1MB/6.0	6/90	Free
Easy Color Paint	2.0	1MB/6.02	9/90	$12
Empower II ★	3.03	1MB/4.2		Free
EndLink	1.1	512K/3.2		Free
EndNote Plus		512KE/3.2		$49
Exodus	2.0	1MB/6.0		$50
Extender GrafPak	3.0	1MB/6.02		$30
Falcon	2.2	1MB/3.2		$3
Fastback II	2.1	512KE/4.1		$30
Fast Forms	2.0	1MB/6.0	11/90	$25
FastLabel	2.0	1MB/6.0		$36
FastTrack	1.5	512KE/5.5		$20
FaxGate ★	1.02	1MB/6.0		Free
Ferrari Grand Prix ★	1.6	512K/3.2		$10
FetchIt	2.0	512K/6.01		*
FileMaker Pro	1.0	1MB/4.2	2/91	*
Filevision IV	1.1	1MB/4.2		$15
FilmMaker	2.0	5MB/6.0.3		*
Finale	2.01	1MB/6.02	5/90	$5
Financial Analysis	3.0	512K/3.0		*
Findswell	2.01	512KE/3.2	3/90	*
Fontographer	3.1	1MB/4.2	5/90	*
FontShare	2.0	1MB/6.0		Free
FormsProgrammer ★	2.03	1MB/6.02		$15
FoxBase+/Mac ★	2.10	1MB/6.0		$75
Freedom of Press ★	2.2	1MB/6.0		Free
FreeFlow	3.0	1MB/6.03		Free
Full Impact ★	2.0	1MB/6.0		$50
FullWrite Professional	1.5	2MB/6.02		*

(continues)

Bold *first time the product is being listed.*

★ *= minor update.*

Req. *= min. RAM and system software required.*

Rev. *= last time(in past year) reviewed this or an earlier version.*

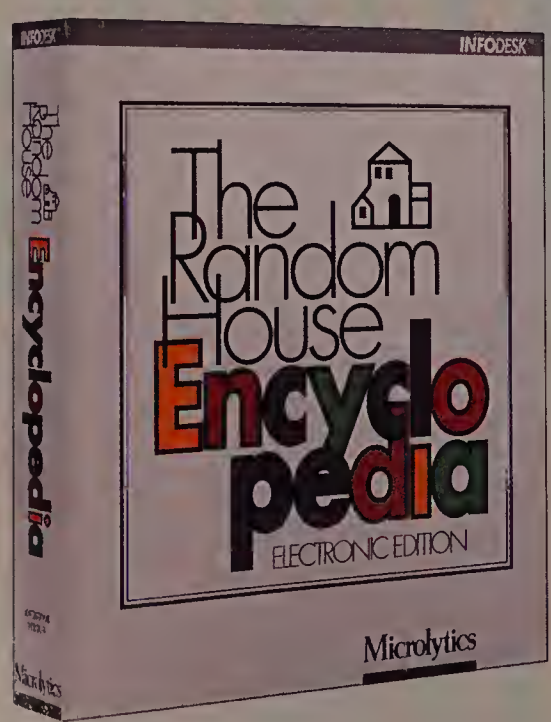
Price *= cost for update to registered owners.*

* *= contact your dealer for update policy.*

PRODUCT UPDATES

Product	V.	Req.	Rev.	Price
Gamblin Times	3.0	1MB/6.0		$10
GeoQuery	2.0	1MB/6.0	10/90	*
Gofer	2.0	1MB/4.1		$25
GQL	2.0	1MB/5.0		*
Grammatik Mac	2.0	1MB/5.0	9/90	Free
Great Gantt	1.2	1MB/6.0	12/90	Free
Great Plains Accounting Series	5.2	1MB/6.0		*
HandOff II	1.1	1MB/6.02	4/90	Free
Handwriting Analyst ★	3.1	512K/3.2		$24.95
Hard Disk Util	3.0	1MB/6.0		$65
Help DA	3.0	1MB/6.0		Free
HFS Backup	3.0	512K/3.2		$35
HydroMac	2.0	1MB/6.0		*
HyperAnimator ★	1.5	1MB/6.03		$29.95
HyperCard	2.0	1MB/6.03		$49
HyperOA ★	1.2	512K/3.2		$10
HyperEngine Developer's Tool ★	1.1	1MB/6.03		Free
HyperLibrary	2.0	1MB/5.0		*
HyperTools	2.0	2MB/6.02		$20
HyperWindows ★	1.2	1MB/6.02		$20
Iconia ★	7.0	1MB/6.0		*
Icon-It	2.0	1MB/6.02	9/90	$29
if:x Forms Designer	1.1	1MB/6.0	9/90	Free
Igor ★	1.1	1MB/6.0	5/90	Free
Image Grabber	2.0	1MB/6.02		Free
ImageStudio	1.5	1MB/6.0		$99
ImageWriter LQ Print Driver★	2.0	512K/3.2		Free
In-CAD	2.0	2MB/6.0		*
InfoLogic Envelope ★	1.1c	512KE/4.0		$5
Insight Expert Accounts Payable	2.2	1MB/6.0		*
Insight Expert Accounts Receivable	2.2	1MB/6.02		*
Insight Expert General Ledger	2.2	1MB/4.2		$99
Inspiration	2.0.5	1MB/4.2	11/90	Free
Instant-Expert Plus	3.0	1MB/5.0		Free
JetLink Express ★	1.01	1MB/6.0		Free
KidsTime ★	1.2	512K/3.2		$15
KiwiEnvelopes	3.0	512KE/4.1		$10
LanguageSystems Fortran★	2.1	2MB/6.04		Free
LapLink Mac III	3.0	512K/2.0	7/90	*
LaserPaint Color II ★	1.02	1MB/6.03		Free
LetraStudio	1.5	2MB/6.0		$45
LetrTuck+	2.0	512K/3.2		$20
Lightspeed Color Layout System	2.0	1MB		*
Lookup	2.0	1MB/6.0	5/90	$15
Mac86	2.0	1MB/6.02		$10
Mac286	2.0	1MB/6.02		$10
Mac3270	2.0	1MB/6.03		*
MacAnalyst	2.0	2MB/6.0		$125
MacArchitrion	4.0	2MB/6.03		Free
MacAtlas Paint	2.0	512K/3.2		$35
MacClassAds	4.0	1MB/6.0		*
MacConcept	3.0	1MB/6.03		*
MacDesigner	3.0	2MB/6.0		$125
MacDraft	2.0	2MB/6.0.2	12/90	*
MacDraw II	1.1	1MB/6.0		*
MacEnvelope	5.0	512KE/3.2		$25
MacEnvelope Plus	2.0	512KE/3.2		$50
MacFalcon	2.1	1MB/6.03		*
MacFlow ★	3.1.5	1MB/6.03		Free
MacFortran	2.4	512K/4.2		*
MacFortran/020	2.4	512K/4.2		*

Put the Encyclopedia on your hard disk!



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MacInUse	3.0	1MB/6.0		$30
MacLinkPlus/PC	4.5	1MB/6.02		*
MacLinkPlus/Wang VS	4.0	512KE/3.2		$45
MacLotto	2.1	512K/4.0		$10
MacMainFrame 3270/CUT	2.1	2.5MB/6.02		$100
MacMoney	3.5	512KE/4.0		$12
MacPhonebook	2.0	512KE/3.2		*
MacPrint	1.23	1MB /6.02		Free
MacProject II	2.1	1MB/6.0		Free
MacProof ★	3.2.1	1MB/6.02		$30
MacRascol	2.0	2MB/4.1		$25
MacRecorder	2.0	512K/3.2		*
MacroMind Director	2.0	2MB/6.02	10/90	$100
MacSafe II		512KE/4.2	10/90	*
MacScan	1.6	1MB/6.0		$35
MacSchedule	2.0	1MB/6.0		$30
MacSmarts	4.0	1MB/6.0		*
MacSpin	3.0	512K/4.2		$75
MacTell	3.5	512K/3.0		*
MacTerminal ★	2.31	512K/3.2		Free
MacVision	3.0	1MB/6.0.2		$50
MacWrite II	1.1	1MB/6.0		Free

Product	V.	Req.	Rev.	Price
Managing Your Money	3.0	1MB/6.03	6/90	$49.95
MapGrafix	2.0	4MB/6.03		Free
Maple	4.2.1	1MB/6.0		*
MarcoPolo	1.1	1MB/6.0		Free
MarketMaster	II+	1MB/6.03		$25
MarkUp	1.02	1MB/6.0	5/90	Free
Master Tracks Pro 4	4.12	1MB/4.1	6/90	$45
MathCAD ★	2.06	1MB/6.0.2		Free
MathType	2.1	512K/6.02		*
Matlab	1.2	1MB/3.0		*
MaxPage ★	1.2	512K/3.2		Free
McClint	2.0	1MB/4.2		$25
McCPrint	2.0	512K/4.2		$25
McMax	2.0	1MB/5.0		*
Memorybank Manager	3.0	1MB/6.0		Free
Mesa Graphics Plotter Utility	1.03	512KE/5.0		*
Metamorphosis	1.5	1MB/6.03	8/90	Free
MGMStation ★	2.5	512KE/3.0		*
MiBAC Jazz Improvisation	1.2.2	1MB/6.0	11/90	Free
MicroPhone II	3.0	512K/4.2	7/90	*
Microsoft Excel	2.2	1MB/6.0.2		*

Product	V.	Req.	Rev.	Price
Microsoft File	2.0	512K/3.2		*
Microsoft Mail	2.0	1MB/6.02		*
Microsoft PowerPoint	2.01	1MB/6.0		Free
Microsoft Word	4.0	512KE/3.2		*
Microsoft Works	2.0	512K/6.0		*
MindWrite ★	2.1	512KE/4.2		*
MiniCad Plus	3.0	1MB/6.0		*
MiniDraw	4.0	512KE/4.2		$17
MockPackage Plus Utilities	4.4	512KE/3.2		$15
ModelShop	1.1	1MB/6.02		$10
Modern Artist	2.0	2MB/6.02		$150
Monte Carlo	2.0	1MB/6.03		$60
More ★	3	1MB/4.1	12/90	*
MSFL: Pro League Football	2.0	1MB/6.0		*
Multi-Ad Creator	2.2	2MB/6.03		*
MultiClip	2.0	512K/6.02	8/90	*
MultiLedger ★	1.1	512K/3.2		Free
MusicProse	1.01	1MB/6.0	4/90	Free
Music Publisher	2.5	1MB/6.0		*
MyDiskLabeler III		1MB/6.0		$25
MyTimeManager	2.0	1MB/6.0	5/90	*
NanoDisk	2.0	4MB/6.04		Free

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Circle 340 on reader service card

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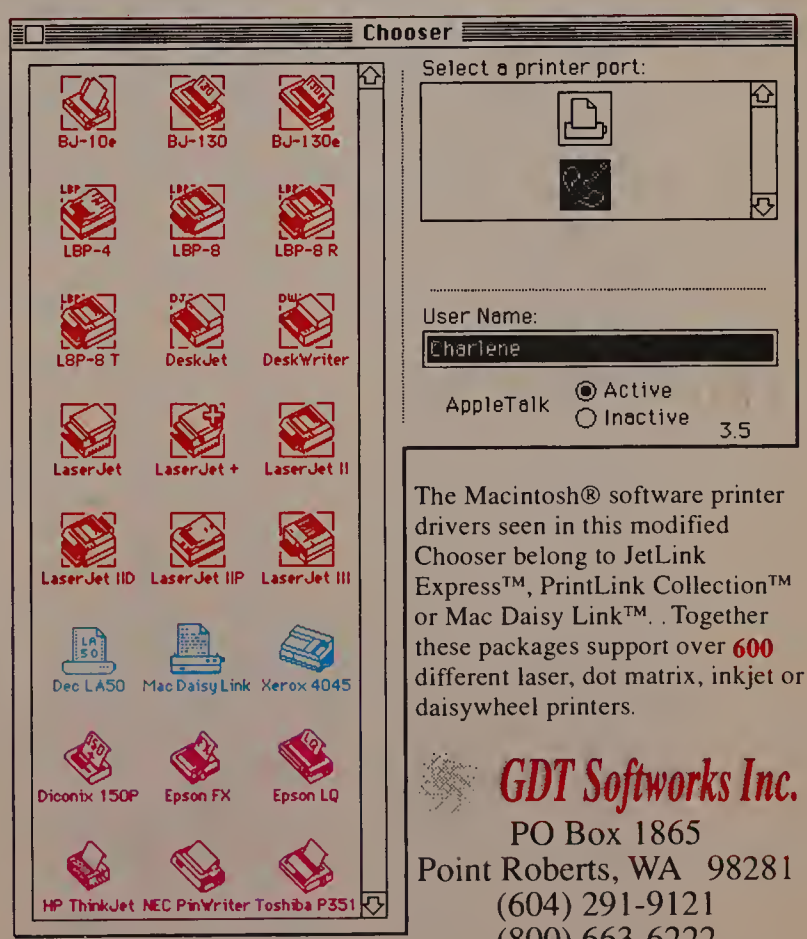

The Macintosh® software printer drivers seen in this modified Chooser belong to JetLink Express™, PrintLink Collection™ or Mac Daisy Link™. . Together these packages support over **600** different laser, dot matrix, inkjet or daisywheel printers.

GDT Softworks Inc.
PO Box 1865
Point Roberts, WA 98281
(604) 291-9121
(800) 663-6222

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Circle 317 on reader service card.

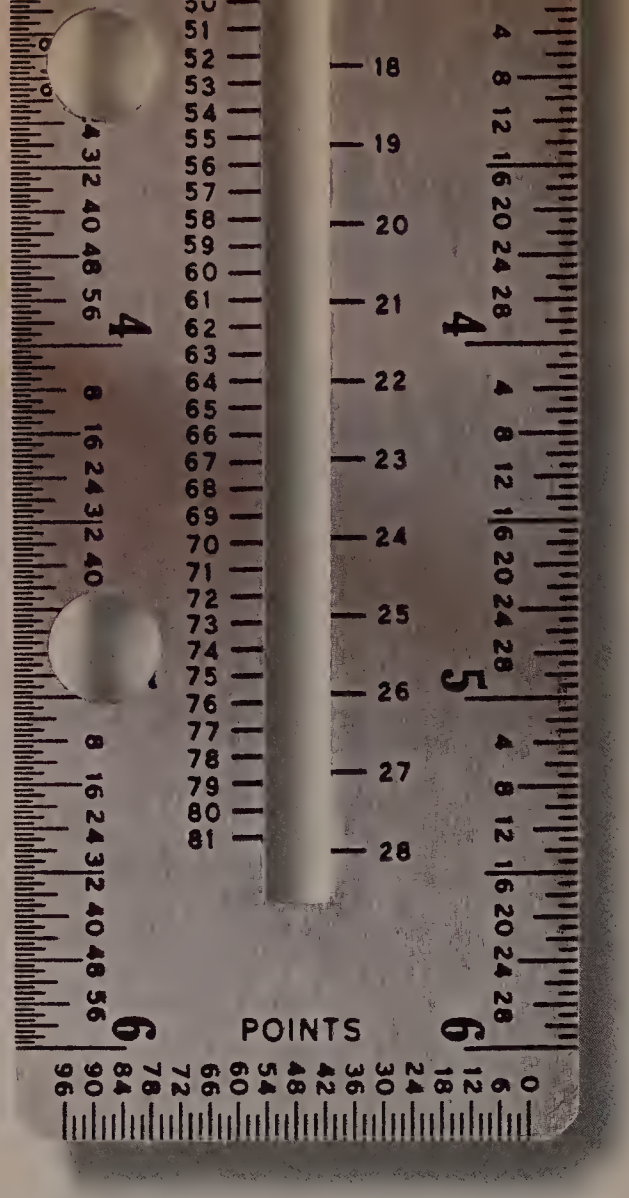
PRODUCT UPDATES

Product	V.	Req.	Rev.	Price
Navigate	2.0	1MB/6.0		Free
Nemesis Go Master	4.0	512K/4.1		*
NetMinder Ethernet	1.1	2MB/6.0		Free
Network DiskFit	1.5	512K/4.1		$30
The NightWatch ★	1.03	512KE/3.2		*
Nisus	3.04	1MB/6.02	2/91	Free
Now Utilities	2.0	1MB/6.02		$25
NuPaint ★	1.04	512K/3.2		Free
NuTools	1.2	1MB/6.0		*
Nutrition Stack	2.0	1MB/6.02		$20
OmniPage ★	2.1	1MB/6.02		Free
Omnis 3 Plus/Express	2.0	512KE/3.2		*
On Schedule	2.0	1MB/3.0		*
P51 Mustang Flight Simulator	2.80	512K/3.2		$10
PacerLink	5.0	512K/5.0		*
Panorama	1.5	1MB/4.2		$29.95
Paper Keyboard	1.2	2MB/6.03		$25
PEGASYS II	3.2	1MB/6.03		Free
Performer Sequencer	3.5	1MB/6.0		Free
Personal Golf Stats	2.0	512K/3.2		Free
Personal Phone ★	1.1	1MB/6.0		*
Personal Reference Catalog	2.0	1MB/6.0	10/90	$10
Phonenet Liaison	3.0	1MB/4.2		$75
PhotoMac	1.5	2MB/6.03		$75
PhotoMacEdit	1.5	2MB/6.03		$30
The Phrase Thesaurus	2.0	1MB/6.0		Free
PICT Detective	2.0	512KE/6.0		$20
PixelPaint	2.0	2MB/4.1		$99
PixelPaint Pro	2.0	3MB/6.0.3		$125
Plains & Simple ★	1.06	1MB/3.2		*
Plus	2.0	2MB/6.0		$45
PostShow	1.1	1MB/6.0		$35
PowerDraw	3.0	1MB/6.0		*
PowerStation ★	2.5.2	512K/4.1		Free
PowerTools	3.0	4MB/6.0		*
Practica Musica	2.1	512K/3.2		$10
Printer Interface III	2.0	512K/6.02		$22.50
Pro-Cite ★	1.3	512K/4.1		*
Professional Composer	2.3	1MB/6.03		Free
Professional Image II	2.0	1MB/6.0		$22
The Programmer's Online Companion	2.0	1MB/6.02		$10
Prograph	2.0	2MB/6.0	8/90	*
Property Management III		1MB/6.0.1		$100
PropsForms	2.0	1MB/6.03		Free
Prototyper ★	2.01	1MB/4.1		$79
Publish-It	1.2	512KE/5.0		*
Publish or Perish	5.0	512K/4.2		$10
Pyro	4.0	512K/4.1	7/90	$15
Q-Sheet A/V	2.0	1MB/6.0	10/90	$50
QuarkXPress	3.0	2MB/6.0.5	11/90	$30

Product	V.	Req.	Rev.	Price
Quicken ★	1.5	512K/5.0		$30
QuicKeys²	2.0	1MB/6.02	1/91	$49.95
QuickLetter	1.1	512KE/5.0		$30
QuickLock	2.0	512KE/3.2	10/90	Free
QuickMail	2.2	512KE/3.2		$95
QuickShare	2.0	512KE/3.2		$75
QuickShot ★	2.1	1MB/4.2		$5
RagTime 3	3.04	2MB/6.0	8/90	$150
Read-It OCR Personal	2.1	1MB/6.03		$29
Read-It OCR Professional	3.0	2MB/6.03		*
ReadySetGo	4.5	1MB/6.0		*
Real Estate Edge	2.0	1MB/6.03		Free
Rendezvous	2.5	512KE/4.1		$15
Reports ★	1.2	1MB/6.0		Free
Retail Engine	3.0	1MB/6.0		*
Sales and Market Forecasting Toolkit	2.0	1MB/6.0		$49
Sales Associate	1.10	1MB/6.03		Free
SAM	2.0	1MB/6.0	2/91	$29.95
ScenMan Model 32		1MB/6.0	10/90	Free
ScheduleMaker ★	3.01	1MB/6.0		$25
ScreenSnap ★	2.2	1MB/4.2		*
ScriptEdit	1.1	1MB/6.04	3/90	*
Second Sight	2.0	1MB/6.02		$33.75
Sentinel	2.2	1MB/6.0		$30
Shanghai	2.0	1MB/6.02		$13
Shortcut	1.5	1MB/6.0	3/90	Free
SimMac	3.1	1MB/6.02		Free
SimpleSpan	2.5	512K/3.2		*
Smart Alarms & Appointment Diaries	3.1	1MB/6.02	12/90	$25
Smart Alarms & Multi-User Appointment Diaries	3.01	1MB/6.02	12/90	*
SmartForm Assistant	1.1	1MB/6.0		Free
SmartForm Designer	1.1	1MB/6.0		Free
SmartScrap & The Clipper	2.0	1MB/6.03		$20
Snap ★	3.1	1MB/3.0		*
SoftPC ★	1.3	2MB/6.0		*
Sound Designer Universal ★	1.5	512K/6.03		$45
Spelling Coach Professional	3.1	512KE/4.2		*
Spellswell ★	2.2	512K/3.2	5/90	$20
Springboard Publisher	2.0	1MB/6.0		*
Stepping Out II	2.0	1MB/4.1		Free
StickyBusiness	1.06	512KE/6.03		Free
Still Light	3.0	1MB/6.0		Free
StrataVision 3d	2.0	2MB/6.03	4/90	$99
Suitcase II	1.2.6	512KE/4.1		$25
Super 3O	2.1	512KE/6.02		Free
SuperANOVA	1.1	1MB/6.02	5/90	Free
SuperGlue II with GlueNotes	2.1	1MB/6.0		*

Product	V.	Req.	Rev.	Price
SuperLaserSpool	2.0.2	1MB/6.0		$30
SuperPaint	2.0	1MB/6.02		$50
SuperSpool	5.0	512K/4.1		$30
Sybil	2.0	1MB/6.0	11/90	*
Synchronicity	2.5	512KE/3.2		$10
Systat	5.0	4MB/6.0		$190
Teacher's Rollbook ★	2.2	512K/3.2		$17.95
Tempo II	1.02	1MB/4.2		*
Tempo+ Tools ★	1.1	1MB/4,2		*
Ternary Plot	3.0	512K/3.2		*
TextPert ★	3.01	1MB/6.0		Free
TextScan	3.04	1MB/6.0		$69.95
TGRAF-07/Mac	2.0	2MB/6.0		*
Think C	4.0	1MB/5.0		*
Think Pascal	3.0	1MB/5.0	11/90	$69
ThunderWorks	1.0.3	1MB/6.0.2		$69
Timbuktu	3.1	1MB/4.1	10/90	*
Timbuktu/Remote	2.0	1MB/4.1	3/90	*
TimeMinder	2.0	1MB/4.2		$50
Timeslips III	2.0	1MB/6.02		*
TML Pascal II	3.0	1MB/5.0		$79.95
TOPS/Mac	3.0	512K/3.2		*
Trapeze ★	2.1	1MB/6.0		$35
TrueBASIC ★	2.02	1MB/6.0		Free
TrueForm ★	1.1	1MB/6.2	4/90	Free
TurboCASE	2.0	1MB/6.0		$25
Turbosynth	2.0	1MB/6.03		$35
Typeface Library	1.5	1MB/6.03		*
TypeStyler	1.5	1MB/4.1	7/90	*
UNITize ★	1.3	512KE/3.2		$20
UpBeat	2.01	1MB/6.0	8/90	$75
VersaCAD/ Macintosh Edition ★	2.11	1MB/6.0		Free
Vietnam War	2.0	1MB/6.0		*
Virex	2.8	1MB/4.2		$15
Virtual 2.0 for 030	2.03	1MB/4.2		Free
Virtual 2.0 for Mac II	2.03	1MB/4.2		Free
Virtual 2.0 for Mac Plus	2.02	1MB/4.2		Free
Vision	1.1	1MB/6.03		Free
VMacS	2.0	1MB/6.0		$25
Voyager	1.2	1MB/6.0	4/90	*
Wall Street Investor	3.0	1MB/5.0		$150
White Knight II	11.6	1MB/6.02	7/90	$35
Wild Things ★	1.1	1MB/6.0		Free
WillMaker	4.0	512KE/4.2		$18.50
Wingz ★	1.1	1MB/6.0		Free
Word Finder	2.0	512K/3.2		*
WordPerfect for the Macintosh	2.0	1MB/4.2		*
WorksPlus Command	2.0	2MB/6.03		$35
WorksPlus Spell	2.0	1MB/6.03		$35
WriteNow	2.2	512K/4.2	9/90	$49

To have products listed in this section, send upgraded software, an outline of changes since the previous release (indicate if it's a maintenance upgrade), upgrade price, minimum RAM and system software, suggested retail price, company name, mailing address, and phone number to *Updates, Macworld,* 501 Second St., San Francisco, CA 94107.



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WHERE TO BUY

A Guide to Products Featured in This Issue

This listing provides companies and phone numbers for products mentioned in this issue. Allow several weeks for responses to reader service card inquiries. Asterisks indicate vendors who prefer to be contacted by phone.

Reader Service

601 **3000 series** Iris Graphics; 617/275-8777.
602 **4th Dimension** ACIUS; 408/252-0831.
603 **4693DX Color Image Printer** Tektronix; 503/682-7377, 800/835-6100.

A

* **Administrator's Aid** ICATT; Spinozastraat 51, 1018 HJ Amsterdam, Netherlands.
604 **Adobe Font Software Downloader, Adobe Illustrator, Adobe Photoshop, Adobe Type Manager, Adobe Type Reunion** Adobe Systems; 415/961-4400, 800/833-6687.
609 **AgentDA** Team Building Technologies; 514/278-3010.
610 **Alchemy** Passport Designs; 415/726-0280.
611 **Aldus PageMaker, Aldus PrePrint** Aldus Corp.; 206/628-2320.
613 **A.M.E.** Casady & Greene; 408/624-8716, 800/359-4920.
614 **Analog Interface** Digidesign; 415/688-0600, 800/333-2137.
615 **Aperture Network & Resource Manager** Aperture Technologies; 800/342-9022.
616 **AppleShare Print Server, AppleTalk Internet Router** Apple Computer; 408/996-1010.
618 **Astrix** Microseeds Publishing; 813/882-8635.
619 **Audiomedia** Digidesign; 415/688-0600, 800/333-2137.
* **AutoMac III** Microsoft Corp.; 206/882-8080, 800/426-9400.
620 **Avid/1 Media Composer** Avid Technology; 617/221-6789.

B

621 **Bernoulli Transportable** Iomega Corp.; 801/778-1000, 800/456-5522.
622 **Business LaserPrinter IIS (BLP IIS)** GCC Technologies; 617/890-0880, 800/422-7777.

C

623 **CalenDAr** Psybron Systems; 304/340-4260, 800/866-4260.
624 **Cataloger** Masters Publishing; 313/971-1118.
625 **CHC-445** Mitsubishi International Corp.; 408/980-1100.
626 **Classified Ad Tracking System** Eclipse Services, a division of Quadrivium; 215/352-6800.
627 **ClassManager** Baseview Products; 313/426-5751.
628 **ClickChange** Dubl-Click Software; 818/700-9525, 800/359-9034.
629 **Colorado Color Imaging Recorder** Metrum Information Storage; 800/328-5111.
630 **ColorBoard 208, ColorBoard 264, ColorBoard 364** RasterOps Corp.; 408/562-4200, 800/468-7600.
634 **ColorCapture** Data Translation; 508/481-3700.
635 **Colormate PS** NEC Technologies; 508/264-8000, 800/632-4636.
636 **ColorPoint PS** Seiko; 408/922-5800, 800/873-4561.
637 **ColorQuick Ink-Jet Printer** Tektronix; 503/682-7377, 800/835-6100.
638 **ColorSnap-32, ColorSnap-32+** Computer Friends; 503/626-2291.
639 **ColorSpace IIi, ColorSpace FX, ColorSpace Plus/SE** MASS Microsystems; 408/522-1200, 800/522-7979.
642 **ComputerEyes, ComputerEyes Professional** Digital Vision; 617/329-5400.
644 **CopyFlow** North Atlantic Publishing Systems; 508/250-8080.

D

645 **DataShaper** ElseWare Corp.; 206/547-9623.
646 **DAT I/O Digital Interface** Digidesign; 415/688-0600, 800/333-2137.
647 **DB Report Writer** Desjardin Consulting; 415/659-1546.
648 **Deck** Digidesign; 415/688-0600, 800/333-2137.
649 **DesignScript, DesignStudio** Letraset Graphic Design Software; 201/845-6100, 800/343-8973.
651 **DigiVideo, DigiVideo Color** Aapps Corp.; 408/735-8550.
653 **DisplayServer-TV** Lapis Technologies; 415/748-1600.
654 **Double Helix II** Odesta; 708/498-5615, 800/323-5423.
655 **DQ-Animaq** Diaquest; 415/526-7167.
656 **DT2879-60HZ** Data Translation; 508/481-3700.
657 **DVA-4000/Macintosh** VideoLogic; 617/494-0530.

E

658 **Edit Worx** Specialized Computer Systems; 707/539-9003.
659 **EtherPeek** Avant Garde Group; 415/937-7900.
660 **Events Listing System** Eclipse Services, a division of Quadrivium; 215/352-6800.

F

* **FileMaker Pro** Claris Corp.; 408/987-7000.
661 **The Fool's Errand** Miles Computing; 818/340-6300.
662 **FrameGrabber 324NC** RasterOps Corp.; 408/562-4200, 800/468-7600.
663 **FrameMaker** Frame Technology; 408/433-3311, 800/843-7263.
664 **Freebies XTension** Quark; 303/934-2211, 800/356-9363.

G

665 **G370-10** Mitsubishi Electronics America; 213/515-3993.
666 **Go Junior** Toyogo; 808/254-1166, 800/869-6469.

H

* **HP PaintJet Color Graphics Printer, HP PaintWriter XL** Hewlett-Packard; 800/752-0900.
* **HyperCard VideoDisc Toolkit** APDA-Apple Computer; 800/282-2732.
667 **HyperMIDI** Ear Level Engineering; 213/316-2939.
668 **HyperMusic** Passport Designs; 415/726-0280.

I

669 **Image Capture Board** Scion Image Systems; 301/845-4045.
670 **IMTX 8000** Interactive Media Technologies; 602/443-3086.
671 **Internet Manager** Shiva Corp.; 617/252-6300, 800/458-3550.

(continues)

Reader Service

672 **InterPoll** Apple Computer; 408/996-1010.

• **The Investor** P3; 312/729-2555.

J

673 **Jam Session** Brøderbund Software; 415/492-3200, 800/521-6263.

K

674 **Keyboard Shelf** Kensington Microware; 212/475-5200, 800/535-4242.

675 **KiwiFinder Extender** Kiwi Software; 805/685-4031.

676 **Kodak XL 7700** Eastman Kodak Co.; 415/946-1300, 800/445-6325.

L

677 **LANalyzer Network Analyzer** Novell; 801/379-5663, 800/243-8526.

678 **LaserWriter font utility** Bitstream; 617/497-6222, 800/522-3668.

679 **LetrTuck and PMTracker** EdCO Services; 813/962-7800, 800/523-8973.

680 **Light Checkbook Accounting for the Macintosh** DacEasy; 214/248-0205, 800/877-8088.

681 **Light Source Software for NEC PC-VCR** NEC Professional Systems Division; 800/562-5200.

M

682 **MacDraw II** Claris Corp.; 408/987-7000.

683 **The Macintosh Bible, Software Disks** Goldstein & Blair; 415/524-4000.

684 **Macintosh Display Card 4•8, Macintosh Display Card 8•24 GC** Apple Computer; 408/996-1010.

686 **MacInUse** SoftView; 805/385-5000, 800/622-6829.

687 **MacProteus** Digidesign; 415/688-0600, 800/333-2137.

688 **MacRecorder** Farallon Computing; 415/596-9100.

689 **MacSleuth** Dariana Technology Group; 714/994-7400, 800/541-6579.

690 **MacToken** EDI Communications; 408/996-1343.

691 **MacVac, MacVac-S** Advanced Digital Imaging; 714/725-0154.

• **Mac Video Color Card** VENT; 415/961-3671.

692 **MacVision** Koala Technologies; 408/287-6311.

693 **Market Manager Plus** Dow Jones & Company; 609/520-4000.

694 **MasterJuggler** ALSoft; 713/353-4090.

695 **MasterStrokes** Datadesk International; 818/998-4200, 800/826-5398.

• **Microsoft Word, Microsoft Works** Microsoft Corp.; 206/882-8080, 800/426-9400.

696 **Microtech R50** Microtech International; 203/468-6223, 800/626-4276.

697 **MicroTV** Aapps Corp.; 408/735-8550.

698 **MIDI Hits** Passport Designs; 415/726-0280.

799 **MM1600SS** Para Systems; 214/446-7363, 800/238-7272.

700 **MultiGate Manager** Network Resources Corp.; 408/263-8100.

701 **Multimedia Toolkit** Light Source; 415/332-3288.

N

702 **Neotech Image Grabber** Advent Computer Products; 619/942-8456.

703 **NetAtlas** Farallon Computing; 415/596-9100.

704 **NetControl** International Business Software; 408/552-8000, 800/733-2822.

705 **NetMap** AESP; 305/944-7710, 800/446-2377, 800/289-2377 in California.

706 **NetMinder Ethernet** Neon Software; 415/283-9771.

707 **NetUpdater** MDG Computer Services; 708/818-9991.

708 **Network SuperVisor** CSG Technologies; 412/471-7170, 800/366-4622.

709 **Nisus** Paragon Concepts; 619/481-1477, 800/922-2993.

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ADVERTISER INDEX

READER SERVICE NUMBER	
—	Abaton, 241
190	Abra MacDabra, 108B
340	Add-On America, 295
—	Adobe Systems, 69
—	Agfa-Compugraphic, 88-89
—	Aldus, 297
35	Altsys, 264
49	American Power Conversion, 271
56	Asante Technologies, 48
120	Aura Systems, 110
261	Avatar, 124A
108	Avery, 285
118	Banner Blue Software, 76
381	Berkeley Systems Design, 46
5	Beverly Hills Computer, 320
233	Bimillennium, 14-15
—	Bottomline, 322-323
220	Caravelle, 90
16	Casady & Greene, Inc., 290
191	Caymen Systems, 108A
32	CDA Computer Sales, 191-194
8	Chinon, 109W
147	ChipSoft, 260-261
—	Claris, 71, 80-81, 219
319	CompuServe, 216
202	Computalabel, 349
10	Computer Associates, 298
188	Contemporary Cybernetics, 282
20	Curtis Manufacturing, 16
259	Dantz Development, 108D
45	DataViz, 87
97	Deltaic Systems, 108B
346	Deneba Software, 25
336	Design CAD, Inc., 116
337	Design CAD, Inc., 116
—	Direct Advantage, 49
79	Diskette Connection, 307
368	Dr. Mac, Inc., 310-311
303	E-Machines, 13
2	Ehman, Inc., 128
144	Ehman, Inc., 281
12	Engineered Software, 266
184	ERI Direct, 324
364	Fifth Generation Systems, 292
22	FM Waves, 349
373	FWB, Inc., 33
317	GDT Softworks, 295
359	GE Information Services, 250
170	Generation Systems, 122
157	Generic Software, 203
177	Graphsoft, Inc., 68
—	Hard Drives International, 325
87	Hardware Express, 306
383	Hayes Microcomputer, 228
—	Hewlett-Packard, 252-259
192	I.D.S., 86
—	Image Club, 301
63	In-Focus, 118
380	Innovative Data Design, 82
135	Intelligent Resources, 230
221	International Business Sftwr, 40
260	Iomega, 38-39
21	Jam Software, 351
126	Jasmine, 85
140	Kensington Microware, 27
255	Kensington Microware, C4
187	Kiwi Software, 8
377	Kodak, 199
112	Kodak-Diconix Color 4, 221
199	La Cie, 30-31
342	LaserMax, 232
224	Liberty Systems, 307
209	Mac's Place, 242-249
168	MacAcademy, 34-35
—	MacAmerica, 278A-278B
267	MacAvenue, 111
—	MacAvenue, 205-210
269	MacAvenue, 272-273
189	MacCenter, 321
—	MacConnection, 50-67
331	MacDepot, 314-315
339	MacFriends, 104
58	MacFriends, 277
345	MacFriends, 289
264	MacLand, 308-309
175	MacProducts USA, 312-313
142	MacTel Technology, 318-319
78	MacWarehouse, 131-141
240	MacWarehouse, 286-287
—	MW Earth Conservancy, 124B
—	Macworld Expo, 350
—	MW Global Network, 108X-109X
70	MacZone, The, 94-101
207	Mass Micro Systems, 274A
34	Mathsoft, 108W
37	Meca, C3
276	Meridian Data, 11
160	M/H Group, 124D
57	Microlytics, 294
161	Micron Technologies, 105
116	Micronet Technology, 126
228	Microseeds, 92
—	Microsoft, IFC-1
90	Microtech International, 225
68	Microtek, 114
4	MicroTouch Systems, 44
243	Mirror Technologies, 6-7
139	Mirror Technologies, 120-121
399	Mitsubishi, 29
105	Mouse Systems, 351
28	Multi-Ad Services, 42
257	NEC Technologies, 130
314	NEC Technologies, 268-269
244	Newgen, 235
246	Newgen, 235
280	Nuvotech, 124C
238	Odesta, 41
162	Odesta, 279
370	ON Technology, 12
—	Pacific Data Products, 237
253	Paragon Concepts, 47
100	Peachtree Software, 262
42	Personal Training Systems, 19
266	Pinnacle Micro, 93
356	Pixar, 75
265	ProcomTechnology, 108C
169	PSI Integration, Inc., 212
104	QMS, 79
231	Radius, 43
178	Radius, 45
91	RasterOps, 20-21
111	Reference Software, 74
149	Rodime Systems, Inc., 214
19	Salient, 108D
239	Secure-It, 70
396	Sensible Software, 24
—	Shiva Corp., 5, 9
62	Sigma Designs, 284
—	SNA, Inc., 106, 279
367	SoftSync/BLOC Publishing, 91
94	Softview, 10-11
128	Software Discoveries, 78
210	SPSS, Inc., 107
127	Storage Dimensions, 291
176	Storage Dimensions, 291
166	Supermac, 238
216	Symantec, 36
96	Symantec, 102
—	Symantec, 265
237	Symantec, 267
141	Symantec/Peter Norton, 201
286	Synergy Software, 106
172	Systat, Inc., 223
186	T-34 Microsystems, 307
332	T/Maker Company, 26
248	Tactic Software, 276
33	TBSP, 32
143	Tektronix, 4
158	TeleTypesetting, 266
76	Teleware, 227
211	Texas Instruments, 22
179	Texas Mac Stuf, 317
114	Third Wave Computing, 316
263	3M Data Storage, 72
26	Timeworks, 77
214	Total Systems, 108D
47	Trendsetter Software, 306
85	Ventura Publisher, 274B
59	Virtus Corp., 12
55	Zedcor, 28

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31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100
101	102	103	104	105	106	107	108	109	100
111	112	113	114	115	116	117	118	119	120
121	122	123	124	125	126	127	128	129	130
131	132	133	134	135	136	137	138	139	140
141	142	143	144	145	146	147	148	149	150
151	152	153	154	155	156	157	158	159	160
161	162	163	164	165	166	167	168	169	170
171	172	173	174	175	176	177	178	179	180
181	182	183	184	185	186	187	188	189	190
191	192	193	194	195	196	197	198	199	200
201	202	203	204	205	206	207	208	209	210
211	212	213	214	215	216	217	218	219	220
221	222	223	224	225	226	227	228	229	230
231	232	233	234	235	236	237	238	239	240
241	242	243	244	245	246	247	248	249	250
251	252	253	254	255	256	257	258	259	260
261	262	263	264	265	266	267	268	269	270
271	272	273	274	275	276	277	278	279	280
281	282	283	284	285	286	287	288	289	290
291	292	293	294	295	296	297	298	299	300
301	302	303	304	305	306	307	308	309	300
311	312	313	314	315	316	317	318	319	320
321	322	323	324	325	326	327	328	329	330
331	332	333	334	335	336	337	338	339	340
341	342	343	344	345	346	347	348	349	350
351	352	353	354	355	356	357	358	359	360
361	362	363	364	365	366	367	368	369	370
371	372	373	374	375	376	377	378	379	380
381	382	383	384	385	386	387	388	389	390
391	392	393	394	395	396	397	398	399	400
401	402	403	404	405	406	407	408	409	410
411	412	413	414	415	416	417	418	419	420
421	422	423	424	425	426	427	428	429	430
431	432	433	434	435	436	437	438	439	440
441	442	443	444	445	446	447	448	449	450
451	452	453	454	455	456	457	458	459	460
461	462	463	464	465	466	467	468	469	470
471	472	473	474	475	476	477	478	479	480
481	482	483	484	485	486	487	488	489	490
491	492	493	494	495	496	497	498	499	500
501	502	503	504	505	506	507	508	509	510
511	512	513	514	515	516	517	518	519	520
521	522	523	524	525	526	527	528	529	530
531	532	533	534	535	536	537	538	539	540
541	542	543	544	545	546	547	548	549	550
551	552	553	554	555	556	557	558	559	560
561	562	563	564	565	566	567	568	569	570
571	572	573	574	575	576	577	578	579	580
581	582	583	584	585	586	587	588	589	590
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601	602	603	604	605	606	607	608	609	610
611	612	613	614	615	616	617	618	619	620
621	622	623	624	625	626	627	628	629	630
631	632	633	634	635	636	637	638	639	640
641	642	643	644	645	646	647	648	649	650
651	652	653	654	655	656	657	658	659	660
661	662	663	664	665	666	667	668	669	670
671	672	673	674	675	676	677	678	679	680
681	682	683	684	685	686	687	688	689	690
691	692	693	694	695	696	697	698	699	700
701	702	703	704	705	706	707	708	709	710
711	712	713	714	715	716	717	718	719	720
721	722	723	724	725	726	727	728	729	730
731	732	733	734	735	736	737	738	739	740
741	742	743	744	745	746	747	748	749	750
751	752	753	754	755	756	757	758	759	760
761	762	763	764	765	766	767	768	769	770
771	772	773	774	775	776	777	778	779	780
781	782	783	784	785	786	787	788	789	790
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21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100
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111	112	113	114	115	116	117	118	119	120
121	122	123	124	125	126	127	128	129	130
131	132	133	134	135	136	137	138	139	140
141	142	143	144	145	146	147	148	149	150
151	152	153	154	155	156	157	158	159	160
161	162	163	164	165	166	167	168	169	170
171	172	173	174	175	176	177	178	179	180
181	182	183	184	185	186	187	188	189	190
191	192	193	194	195	196	197	198	199	200
201	202	203	204	205	206	207	208	209	210
211	212	213	214	215	216	217	218	219	220
221	222	223	224	225	226	227	228	229	230
231	232	233	234	235	236	237	238	239	240
241	242	243	244	245	246	247	248	249	250
251	252	253	254	255	256	257	258	259	260
261	262	263	264	265	266	267	268	269	270
271	272	273	274	275	276	277	278	279	280
281	282	283	284	285	286	287	288	289	290
291	292	293	294	295	296	297	298	299	300
301	302	303	304	305	306	307	308	309	300
311	312	313	314	315	316	317	318	319	320
321	322	323	324	325	326	327	328	329	330
331	332	333	334	335	336	337	338	339	340
341	342	343	344	345	346	347	348	349	350
351	352	353	354	355	356	357	358	359	360
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371	372	373	374	375	376	377	378	379	380
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391	392	393	394	395	396	397	398	399	400
401	402	403	404	405	406	407	408	409	410
411	412	413	414	415	416	417	418	419	420
421	422	423	424	425	426	427	428	429	430
431	432	433	434	435	436	437	438	439	440
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511	512	513	514	515	516	517	518	519	520
521	522	523	524	525	526	527	528	529	530
531	532	533	534	535	536	537	538	539	540
541	542	543	544	545	546	547	548	549	550
551	552	553	554	555	556	557	558	559	560
561	562	563	564	565	566	567	568	569	570
571	572	573	574	575	576	577	578	579	580
581	582	583	584	585	586	587	588	589	590
591	592	593	594	595	596	597	598	599	600
601	602	603	604	605	606	607	608	609	610
611	612	613	614	615	616	617	618	619	620
621	622	623	624	625	626	627	628	629	630
631	632	633	634	635	636	637	638	639	640
641	642	643	644	645	646	647	648	649	650
651	652	653	654	655	656	657	658	659	660
661	662	663	664	665	666	667	668	669	670
671	672	673	674	675	676	677	678	679	680
681	682	683	684	685	686	687	688	689	690
691	692	693	694	695	696	697	698	699	700
701	702	703	704	705	706	707	708	709	710
711	712	713	714	715	716	717	718	719	720
721	722	723	724	725	726	727	728	729	730
731	732	733	734	735	736	737	738	739	740
741	742	743	744	745	746	747	748	749	750
751	752	753	754	755	756	757	758	759	760
761	762	763	764	765	766	767	768	769	770
771	772	773	774	775	776	777	778	779	780
781	782	783	784	785	786	787	788	789	790
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PRODUCT INDEX

READER SERVICE NUMBER

Software

BUSINESS
190 Abra MacDabra, 108B
— Aldus, 297
118 Banner Blue Software, 76
16 Casady & Greene, Inc., 290
147 ChipSoft, 260-261
— Claris, 80-81, 219
10 Computer Associates, 298
157 Generic Software, 203
380 Innovative Data Design, 82
187 Kiwi Software, 8
37 Meca, C3
57 Microlytics, 294
— Microsoft, IFC-1
162 Odesta, 279
100 Peachtree Software, 262
356 Pixar, 75
111 Reference Software, 74
— SNA, Inc., 106, 279
367 SoftSync/BLOC Publishing, 91
94 Softview, 10-11
210 SPSS, Inc., 107
216 Symantec, 36
— Symantec, 265
237 Symantec, 267
141 Symantec/Peter Norton, 201
286 Synergy Software, 106
172 Systat, Inc., 223
33 TBSP, 32
76 Teleware, 227
47 Trendsetter Software, 306
55 Zedcor, 28

VERTICAL
190 Abra MacDabra, 108B
— Adobe Systems, 69
233 Bimillennium, 14-15
12 Engineered Software, 266
177 Graphsoft, Inc., 68
100 Peachtree Software, 262
367 SoftSync/BLOC Publishing, 91
186 T-34 Microsystems, 307
33 TBSP, 32
59 Virtus Corp., 12

DATA MANAGEMENT
238 Odesta, 41
128 Software Discoveries, 78
55 Zedcor, 28

WORD PROCESSING
346 Deneba Software, 25
187 Kiwi Software, 8
253 Paragon Concepts, 47
111 Reference Software, 74
396 Sensible Software, 24
332 T/Maker Company, 26
248 Tactic Software, 276
55 Zedcor, 28

CAD/CAM
336 Design CAD, Inc., 116
337 Design CAD, Inc., 116
12 Engineered Software, 266
157 Generic Software, 203
177 Graphsoft, Inc., 68
380 Innovative Data Design, 82
34 Mathsoft, 108W
59 Virtus Corp., 12

COMMUNICATION
340 Add-On America, 295
191 Caymen Systems, 108A
45 DataViz, 87
266 Pinnacle Micro, 93
286 Synergy Software, 106

READER SERVICE NUMBER

HYPERCARD
— Claris, 219

EDUCATIONAL
168 MacAcademy, 34-35

FONTS
— Image Club, 301
158 TeleTypesetting, 266

GRAPHICS/DESKTOP PUBLISHING
— Adobe Systems, 69
— Aldus, 297
35 Altsys, 264
118 Banner Blue Software, 76
346 Deneba Software, 25
22 FM Waves, 349
157 Generic Software, 203
— Image Club, 301
380 Innovative Data Design, 82
28 Multi-Ad Services, 42
356 Pixar, 75
166 Supermac, 238
286 Synergy Software, 106
158 TeleTypesetting, 266
26 Timeworks, 77
85 Ventura Publisher, 274B
59 Virtus Corp., 12

PERSONAL BUSINESS/HOME
147 ChipSoft, 260-261
94 Softview, 10-11

NETWORKING
340 Add-On America, 295
56 Asante Technologies, 48
261 Avatar Technologies, 124A
220 Caravelle, 90
191 Caymen Systems, 108A
221 International Business Software, 40
280 Nuvotech, 124C
160 M/H Group, 124D

LANGUAGES/DEVELOPMENT SYSTEMS
216 Symantec, 36

SECURITY
49 American Power Conversion, 271
16 Casady & Greene, Inc., 290
364 Fifth Generation Systems, 292
96 Symantec, 102
— Symantec, 265
237 Symantec, 267

UTILITIES
108 Avery, 285
381 Berkeley Systems Design, 46
259 Dantz Development, 108D
364 Fifth Generation Systems, 292
317 GDT Softworks, 295
21 Jam Software, 351
187 Kiwi Software, 8
228 Microseeds, 92
28 Multi-Ad Services, 42
370 ON Technology, 12
96 Symantec, 102
— Symantec, 265
237 Symantec, 267
141 Symantec/Peter Norton, 201
248 Tactic Software, 276

MISCELLANEOUS
— Aldus, 297
147 ChipSoft, 260-261
— Claris, 71
202 Computalabel, 349
317 GDT Softworks, 295
42 Personal Training Systems, 19
33 TBSP, 32

READER SERVICE NUMBER

Hardware

COMPUTER SYSTEMS
32 CDA Computer Sales, 191-194
87 Hardware Express, 306
339 MacFriends, 104
58 MacFriends, 277
345 MacFriends, 289
142 MacTel Technology, 318-319

PRINTERS
— Agfa-Compugraphic, 88-89
— Hewlett-Packard, 252-259
377 Kodak, 199
112 Kodak-Diconix Color 4, 221
342 LaserMax, 232
399 Mitsubishi, 29
257 NEC Technologies, 130
244 Newgen, 235
246 Newgen, 235
— Pacific Data Products, 237
104 QMS, 79
143 Tektronix, 4
211 Texas Instruments, 22

BOARDS
207 Mass Micro Systems, 274A
161 Micron Technologies, 105
265 Procom Technology, 108C
169 PSI Integration, Inc., 212
91 RasterOps, 20-21
214 Total Systems, 108D

DIGITIZERS/SCANNERS
8 Chinon, 109W
68 Microtek, 114

DISPLAY
120 Aura Systems, 110
303 E-Machines, 13
144 Ehman, Inc., 281
170 Generation Systems, 122
63 In-Focus, 118
267 MacAvenue, 111
243 Mirror Technologies, 6-7
314 NEC Technologies, 268-269
231 Radius, 43
178 Radius, 45
62 Sigma Designs, 284

MODEM
— Abaton, 241
340 Add-On America, 295
383 Hayes Microcomputer, 228
— Shiva Corp., 5, 9

HARD DISKS/STORAGE
188 Contemporary Cybernetics, 282
97 Deltaic Systems, 108B
2 Ehman, Inc., 128
144 Ehman, Inc., 281
364 Fifth Generation Systems, 292
373 FWB, Inc., 33
192 I.D.S., 86
260 Iomega, 38-39
126 Jasmine, 85
199 La Cie, 30-31
— MacAvenue, 205-210
269 MacAvenue, 272-273
142 MacTel Technology, 318-319
116 Micronet Technology, 126
90 Microtech International, 225
139 Mirror Technologies, 120-121
266 Pinnacle Micro, 93
265 Procom Technology, 108C
149 Rodime Systems, Inc., 214
127 Storage Dimensions, 291
176 Storage Dimensions, 291

READER SERVICE NUMBER

VIDEO
170 Generation Systems, 122
135 Intelligent Resources, 230
207 Mass Micro Systems, 274A
161 Micron Technologies, 105
231 Radius, 43
178 Radius, 45
91 RasterOps, 20-21

EXPANSIONS/UPGRADES
120 Aura Systems, 110
161 Micron Technologies, 105
169 PSI Integration, Inc., 212
214 Total Systems, 108D

SOFTWARE SECURITY DEVICES
140 Kensington Microware, 27
239 Secure-It, 70

INPUT DEVICES
20 Curtis Manufacturing, 16
255 Kensington Microware, C4
4 MicroTouch Systems, 44
105 Mouse Systems, 351

MISCELLANEOUS
120 Aura Systems, 110
63 In-Focus, 118
— Pacific Data Products, 237

Services

ON-LINE SERVICES
319 CompuServe, 216
359 GE Information Services, 250

TRAINING
168 MacAcademy, 34-35
42 Personal Training Systems, 25

Accessories

FLOPPY DISKS/HOLDERS
263 3M Data Storage, 72

MISCELLANEOUS
108 Avery, 285

Mail Order

5 Beverly Hills Computer, 320
— Bottomline, 322-323
32 CDA Computer Sales, 191-194
79 Diskette Connection, 307
368 Dr. Mac, Inc., 310-311
184 ERI Direct, 324
— Hard Drives International, 325
87 Hardware Express, 306
224 Liberty Systems, 307
209 Mac's Place, 242-249
— MacAvenue, 205-210
189 MacCenter, 321
— MacConnection, 50-67
331 MacDepot, 314-315
339 MacFriends, 104
58 MacFriends, 277
345 MacFriends, 289
264 MacLand, 308-309
175 MacProducts USA, 312-313
142 MacTel Technology, 318-319
78 MacWarehouse, 131-141
240 MacWarehouse, 286-287
70 MacZone, The, 94-101
179 Texas Mac Stuf, 317
114 Third Wave Computing, 316
47 Trendsetter Software, 306

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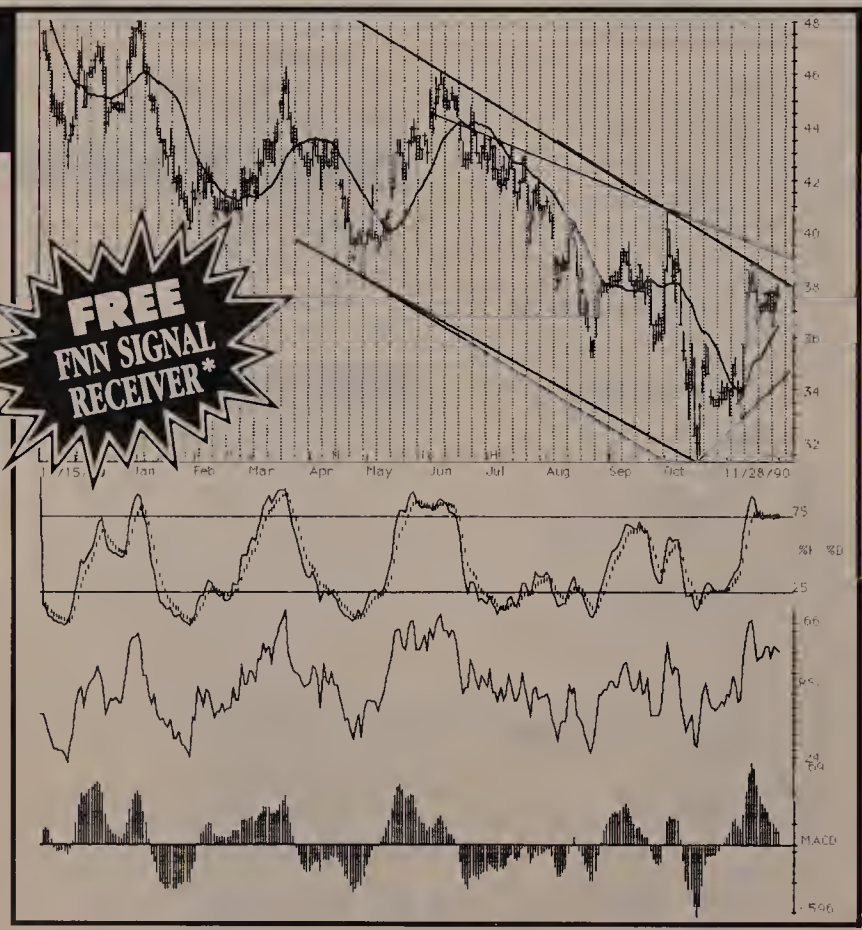

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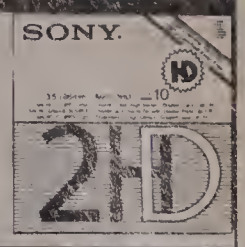

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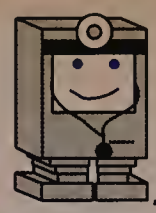

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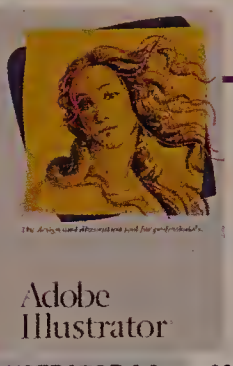

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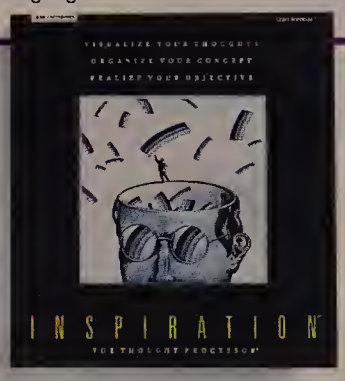

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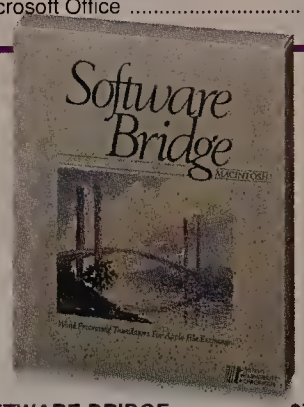

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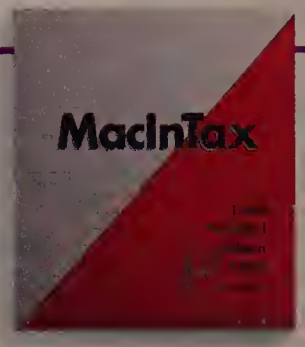

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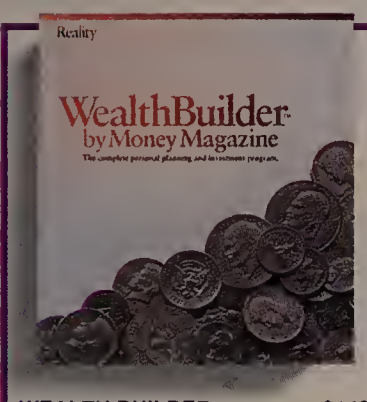

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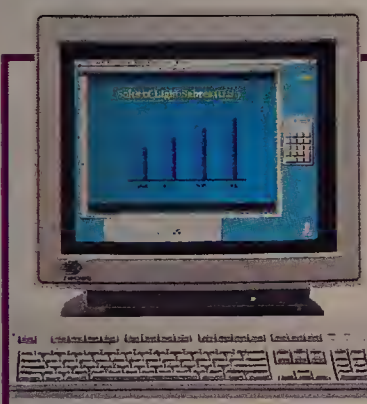

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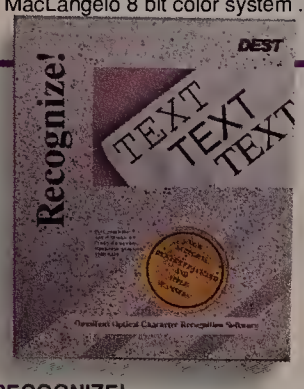

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QMS
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PS 810 2995
QUICKTEL
2400 Baud Modem inc. software ... 119
24/48 Modem/SendFax & software 129
RADIUS
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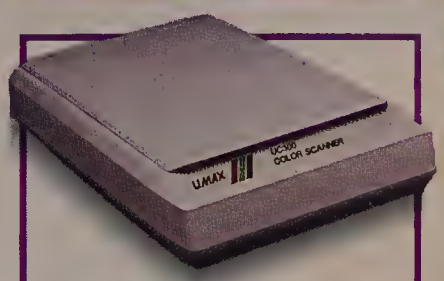

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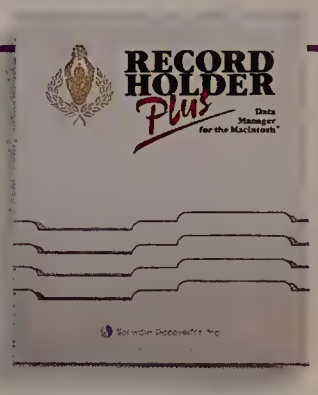

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The one non-relational data manager that makes full use of the Macintosh interface. It includes all the graphics capabilities and data managing options you'll ever need, plus an easy-to-follow tutorial, and over a hundred help screens.

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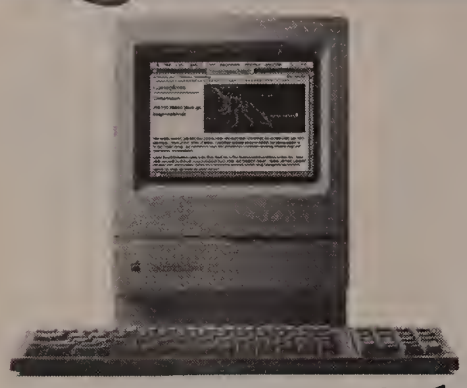

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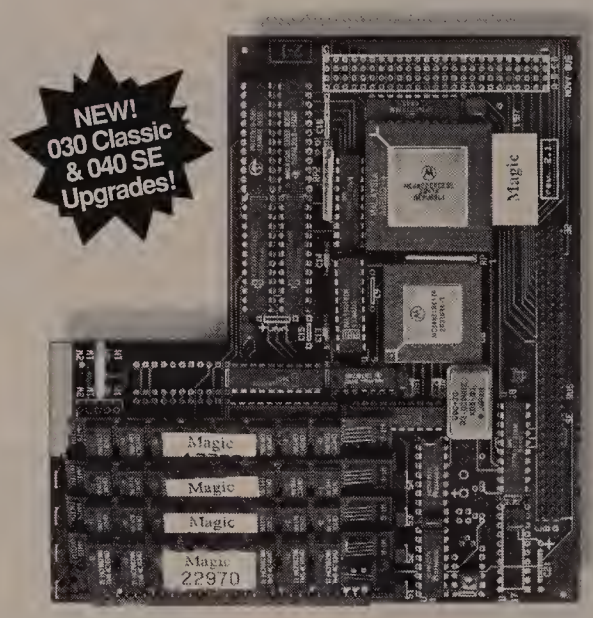
With new accelerated SCSI access!

We can give your original Mac new speed and performance with our Magic RailGun '030' Accelerator for the Plus , SE, & Classic.



16 MHz RailGun for the Plus, SE, Classic.....$499
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MagicView 19" B&W Plus version with card.....$999
Magic 8-bit color card II/SE.....$239/$329
Magic 24-bit color card 13" or 14".....$349
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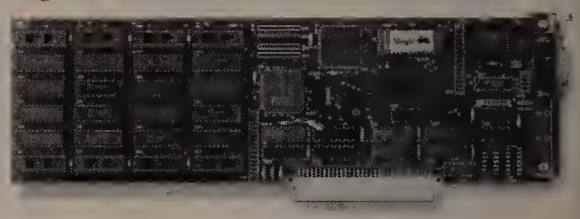

14" NEC MacSync with tilt/swivel.....$449
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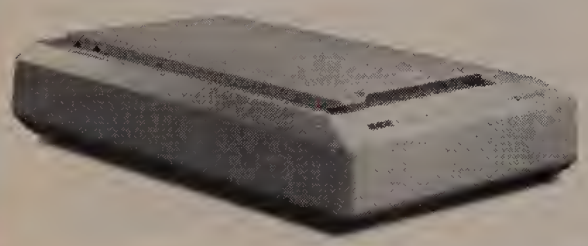

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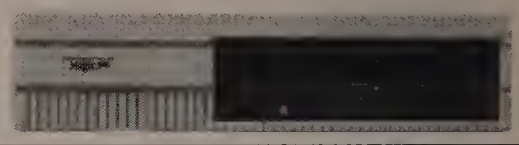
Portable, fast, & affordable removable media. Syquest mechanism. Mac & DOS compatible. 2 year warranty.

45 MB removable drive.....$499
Syquest cartridge.....w/ purchase of drive $67



HARDWARE

Accelerators

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Daystar 33mhz 030 II, IIx /IIcx	1459/1829
Daystar 40mhz 030 II, IIx /IIcx	1669/1969
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Daystar FastCache IIci	289
Daystar PowerCache IIci 50mhz	Call
Daystar SCSI Powercard 0 MB	1133
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Magic RailGun 030 Accelerator 33	1199

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3 Com EtherLink/NB	425
3 Com Etherlink/SE	355
Adaptec AHA SCSI Host	161
Adaptec EtherMac II Nubus	339
Adaptec Nodem E	339
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Asante Maccon+ SE30E	339
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Avatar MacMainFrame II	699
Avatar MacMainFrame II Coax Gate	1755
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Avatar MacMainFrame II/DFT	919
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Cayman Gator Card Ethernet	449
Cayman Gator Mail 10 User	669
Cayman Gator Print	393
Cayman Gator Share	1319
CC Mail LAN Package	339
CE Software QuickMail 5 User	221
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Dayna Net/4L	549
Dayna Port	345
Dayna Talk	96
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DCA MacIRMA LAN 802 2 GW Server	3949
DCA MacIRMA Workstation	925
Digiboard Digichannel NU/4I	689
DMA PC MacTerm II	114
Farallon StarController	825
Farallon StarController EN	1589
Farallon EtherNet Card	415
IBS Data Club Server	359

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InfoSphere LaserServe	51
Infosphere Liason	169
InfoSphere MacServe	142
Magic MagicNet Node 8Pin	18
Novell EtherPort II	489
Novell EtherPort SE,SE/30	449
Nuvotech Nuvolink II	285
Nuvotech Nuvolink SC	319
Nuvotech TurboBridge	309
Nuvotech TurboStar	1049
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Shiva Netserial X232	274
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Sitka Network Bundle Mac	189
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Solutions Mail Maker 5 User	114
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BigTime TV	235
BMUG PD Rom Vol 1	52
CD Technology Porta Drive	679
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MacroMind CD ROM	126
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Calcomp WIZ Tablet	139
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Farallon MediaTrack&MacRecord	315
Farallon MediaTracks	187
Kurta 8.5x11	251

Emulation/Translation

Dayna Dos Mounter	49
Insignia Access PC	78
Insignia SoftPC AT/Drive 1200/Rapport	665
Insignia SoftPC with AT/EGA	339

HARDWARE

Orange Micro Mac 286	1109
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Mouse/Keyboard

Abaton Pro Point	87
Advanced Gravis MouseStick ADB	59
Appoint Mouse Pen ADB	83
Curtis MVP Mouse	87
Datadesk Mac 101 ADB	134
Kensington TurboMouse	109
Keytronic MacPro Keyboard	116
Kraft KM30 Joystick	43
LittleMouse ADB	76

Practical Peripherals
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$499

Modems/ Communication

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AE DataLink External Fax/MNP	249
AE DataLink Internal 2400	199
AE DataLink MacPortable	199
AE Quadralink	199
Anchor Secure 96 External	959
Computer Peripherals VIVA 24 Mnp5	169
Cypress FaxPro 96/24	859
Dove DoveFax Desktop	289
Everex Evercom 24E+ MNP5 Speaker	211
Hayes Personal Modem 2400 SC2	161
Hayes Ultra SmartModem 9600/cbl	865
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Lynx AutoLine Switch Phone/Fax/Data	135
Magic 2400 with SendFax	98
Orchid Technologies Fax Modem	439
Practical Peripherals 2400 MNP 5	219
Practical Peripherals 9600 V.32/V.42	499
Promethius ProModem 2400 Internal	198
Shiva Netmodem 2400	429
Shiva Netmodem V.32	1429
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Telebit Trailblazer Plus 19200 BPS	899
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Computer Eyes B/W	183
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Magic 8 bit color 19	499
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Mass Micro Easy Video 8	445
Mass Micro QuickImage 24	739
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Radius Direct Color 8	1469
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Radius Pivot	749
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Radius Precision Color Calibrator	529
Radius Quick Color Graphics Accelerator	465
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Radius Two Page interface	445
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MacProducts USA

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210 MB hard drive	$899	$999
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300 MB WrenRunner	na	$1999
600 MB hard drive	na	$2350
1.2 gig hard drive	na	$2795

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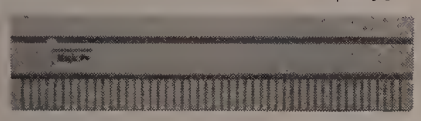
New advanced replacement warranty!



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MagicTape 525 ..... $999
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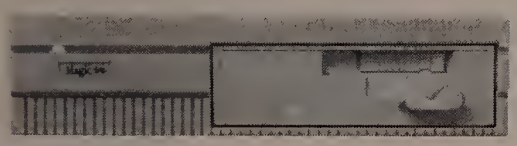

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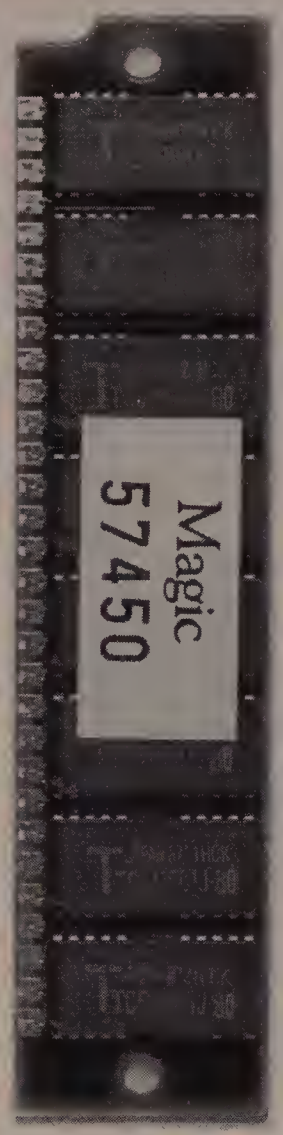

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Magic Modems include a two year warranty and are all 100% Hayes compatible.

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MagicNet $18

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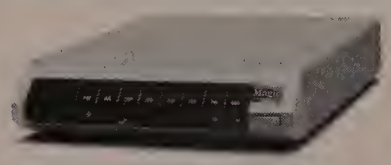
2400 baud- send and receive up to 9600 baud. LAPM & MNP error correction, asynchronous operation, auto adaptive equalization. Two year warranty.
V.42 bis MNP-5 Modem $199



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Two year warranty. 100% Hayes & Group 3 compatible

2400/4800 SendFax/ Modem $99
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2400/9600 Send & Receive $179

HARDWARE

RasterOps 24L 16	4935
RasterOps 24L 19	5780
RasterOps 24L Calibrator sys 19	8960
RasterOps 264/MacII	419
RasterOps 264/SE30	649
RasterOps 364	915
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RasterOps 232	2115
RasterOps Accelerator	819
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RasterOps SFX	1055
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Sayett DataShow HRVM Projection Pad	1069
Sigma ColorMax 8/24 19	4299
Sigma L View MultiMode 19	1399
Sigma Silverview M21	1519
Supermac	Call

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Abaton LaserScript	2499
Adobe PostScript Cartridge	322
Adobe Type Cartridge 1or2	259
Apple Laser Writer IIntx	4199
Apple Personal Laser Writer NT	2299
Calcomp 1023 Plotter	3899
Calcomp Raster Plotters	Call
Co-Star LabelWriter	187
GCC Printers	Call
HP DeskWriter	725
HP LaserJet III	1755
HP LaserJet IIID	Call
HP LaserJet IIP	1089
HP PaintJet	1149
HP PaintWriter XL	2359
Kodak Diconix Color 4	1129
Kodak Diconix M150	485
NEC Colormate PS	6885
NewGen PS-480	5399
Pacific MacPage PostScript HPII Cart	439
Panasonic KXP4455 LaserPartner	2399
QMS ColorScript 100 8mb Deluxe	7619
QMS PS 410	2149
QMS PS 810 Turbo	4399

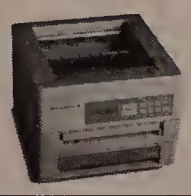
HARDWARE

Seikosha SP2000 Dot Matrix 8Pin	209
Sharp JX-730 color inkjet	1999
Tektronix ColorQuick InkJet /int	2059
TI MicroLaser 17 Postscript	1550
TI MicroLaser 35 Postscript	1750

Accesories, Disks, Ribbons

150 Meg Backup Tape	35
60 Meg Backup Tape	22
American Power 110SE UPS	215
American Power 370ci UPS	339
HP DeskJet Cartridges	17
ImageWriter Black Ribbons	3

TI MicroLaser Printers
PS 17 $1550 PS 35 $1750



ImageWriter Color Ribbons	3
ImageWriter Multi Color Ribbon	11
Jet Fill Desk Jet Re-Fill	10
Kensington Complete Line	Call
MacDisk DS/DD Bulk 50	0
PC Guardian Floppy Lock	27
PC Guardian Mac Anti Theft Pack	34
PC Guardian Mac II/IIcx Lock	67
Sony DS/DD Box 10	9
Sony DS/DD Bulk 50	1
Sony DS/HD Box 10	16
Sony DS/HD Bulk	1
Sopris SE Carrying Bag	55
TI MicroLaser Toner Kit	41

SOFTWARE

Scanners

Abaton 300GS	1350
Caere Typist Hand Scanner	489
Cannon IX-30F Scanner w/interface	1079
HP Scanjet+ w/interface	1599
Logitech ScanMan	335
Magic Scan 256 Grey	1099
Magic Scan 300zs Color/Photoshop	1649
Microtek MSF300ZS	1699
Microtek MSF400GS	2699
Microtek MSII/Interface	999
Sharp JX-300	2499
Sharp JX100	699
Umax 256 300DPI Flatbed	1099

Storage

ADIC MacBack 256 Dual Drive	2489
ADIC MacBack 8000 SCSI 1280Mb	4499
AE 3.5 1.44K	224
AE 3.5 800K	189
Bernoulli LaserSafe M0650	3899
Bernoulli Portable 44mb	1309
Bernoulli Transportable 44mb	1079
Dayna Dual Drive 1.2Mb/1.44Mb	789
Dayna Dual Drive 360K/1.2Mb	650
Dayna Dual Drive 360K/1.44Mb	719
Dayna Single Drive 360K	465
Dayna Single Drive 1.2Mb	539
Dayna Single Drive 1.44Mb	610
Fujitsu 800K Floppy	139
Irwin Magnetics 40mb Tape	639
Irwin Magnetics 80mb Tape	839
Kennect Drive 1200	249
Kennect Drive 2.4	319
Kennect Drive 360	249
Kennect Tech Rapport	191
MassMicro DataPak II Duet	2099
MassMicro DataPak II Removable	1099
MassMicro Optipak RW Optical	3445
Micronet 1.3GB Tape Backup	2799
Micronet CMO Readwritable Optical	2999
Micronet SBT 1174 MB Minitower	5999
Micronet SBT 2022 MB MiniTower	11199
Pinnacle Micro REO650 /interface	3799
PLI Infinity Turbo 45R	769
PLI Turbo Floppy	275
Rodime Cobra 1000E 1 Gig 15ms	6299
Rodime Cobra 100E	1045

SOFTWARE

Rodime R45 Plus Removable	719
Tecmar LaserVault 650 RWO /interface	4129
Tecmar QT Mac 150	1599
Tecmar QT Mac 40	989

Software

4D Compiler	879
Adobe PhotoShop	505
Adobe Type Manager	59
Adobe Type Reunion	39
Aldus PageMaker 4	499
Claris CAD	559
Design Studio	469
DesignCad 2D/3D	362
Disk Doubler	45
Disk Express II	45
Double Helix	369
DynaPerspective	499
Fileforce	249
FileMaker Pro	212
FoxBase Mac Multi	391
Freehand	315
Generic CAD Mac	359
Illustrator 3 & ATM	339
MacProject II	355
MacRenderMan	596
MacroMind Director	437
MiniCad +	489
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Persuasion	315
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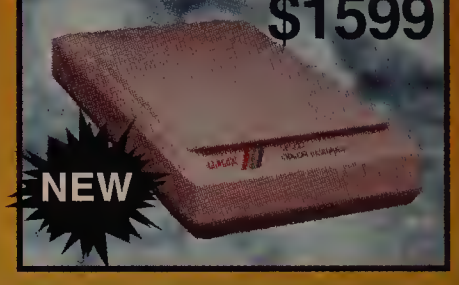

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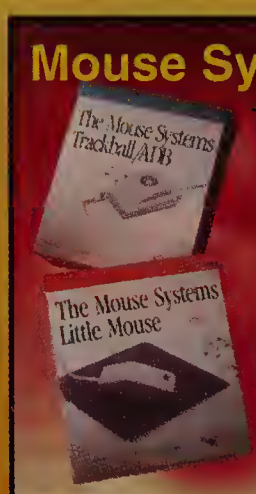

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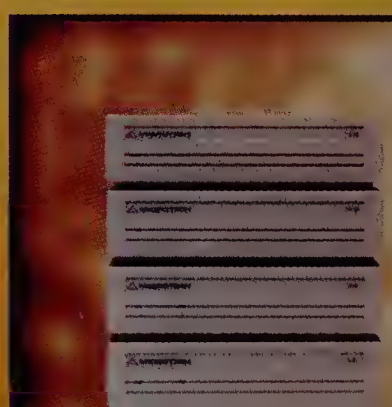

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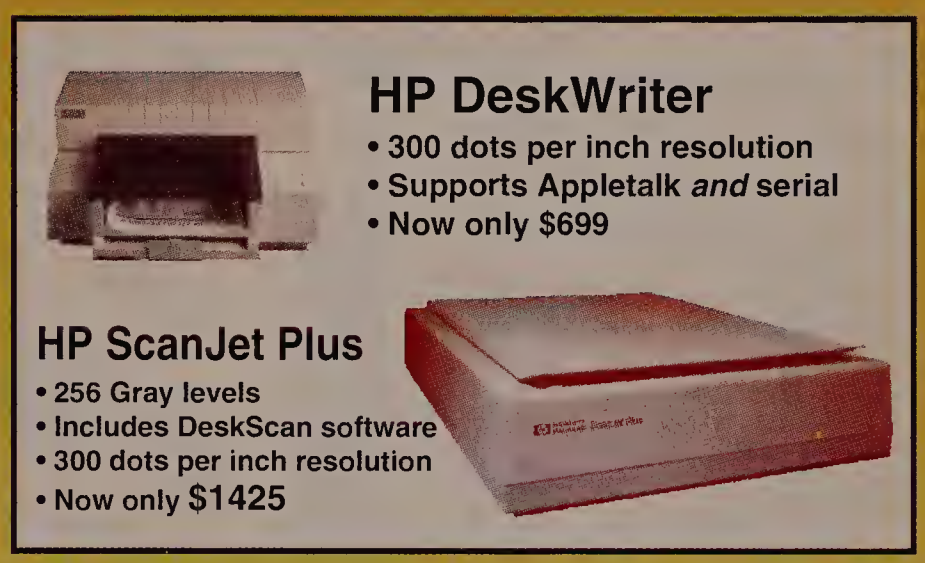

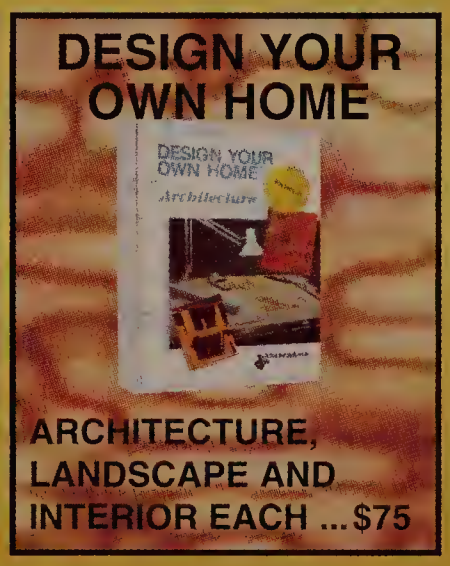

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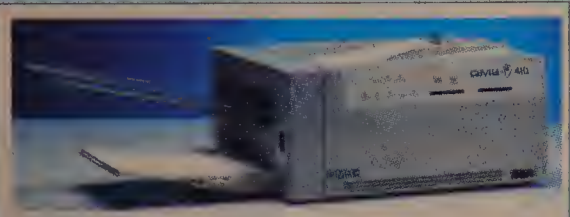

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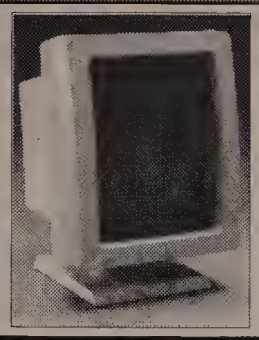

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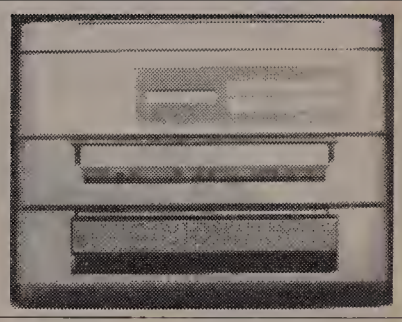

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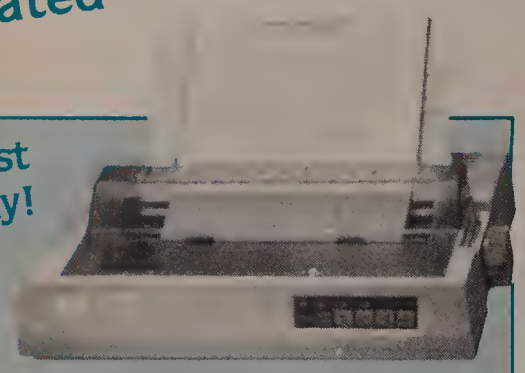

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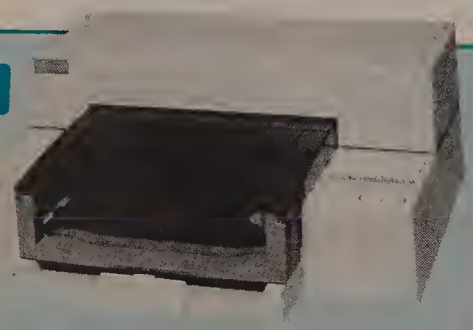

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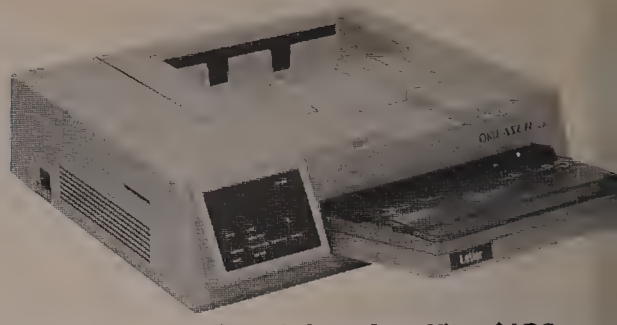

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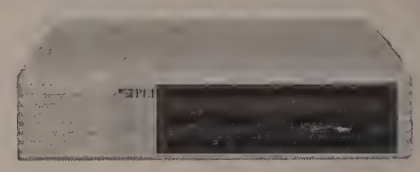

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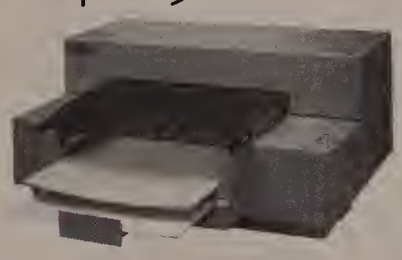

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White Knight	75
WingZ	235
Write Now 2.0	111

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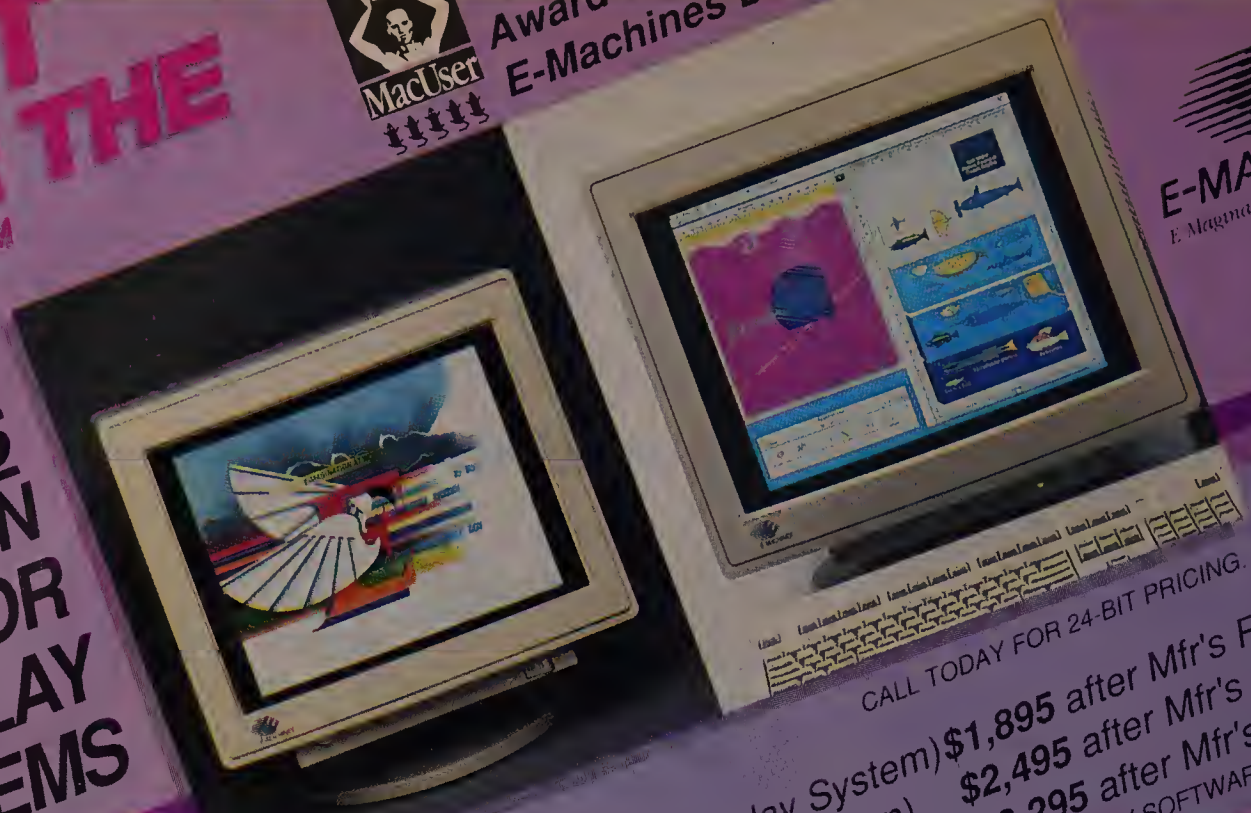

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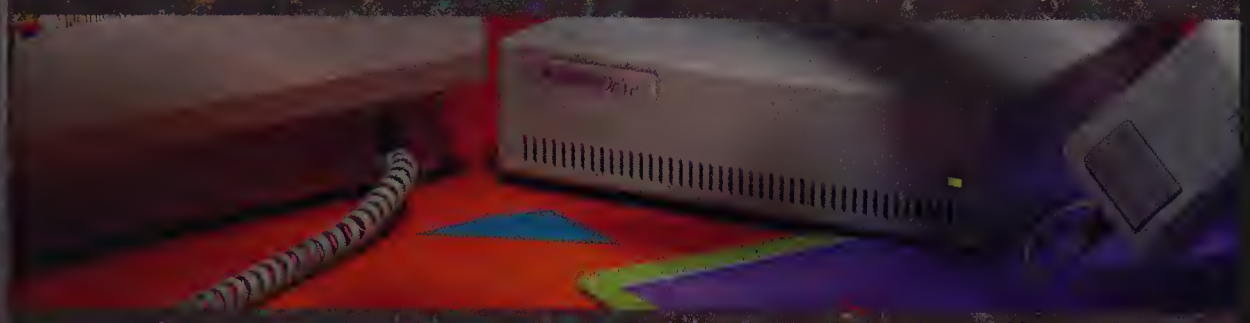

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The Macworld Catalog

Hardware

Bar Code 328
CD Rom 328
Computer Systems 328
Data Acquisition 332
Emulators 322
Hard Drives 322
Memory Upgrade 322
Monitors 334
Peripherals 334
Printers 336
RAM 303367

Software

Astrology 337
Bar Code 337
Business 337
CAD/CAM 337
Children's 338
Clip Art 338
Data Base 338
Desktop Publishing 338
Duplicator 339
Educational 339
Engineering 340
Entertainment 340
Financial 340
Fonts 340
Genealogy 340
HyperCard Stacks 341
Languages 341
Lottery 341
Medical 342
Multimedia 342
Music/MIDI 342
Nutrition 342
Programming Tools 342
Public Domain 342
Real Estate 343
Religion 343
Restaurant 343
Sales/Marketing 344
Scientific 344
Statistics 344

Services

Computer Repair 344
Data Conversion 345
Desktop Publishing 345
Disk Duplication 345
Laser Recharge 345
Multimedia 345

Accessories

Furniture 346
Gifts 346
Mouse Pads 346
Supplies 346

Miscellaneous

Business Opportunities 348

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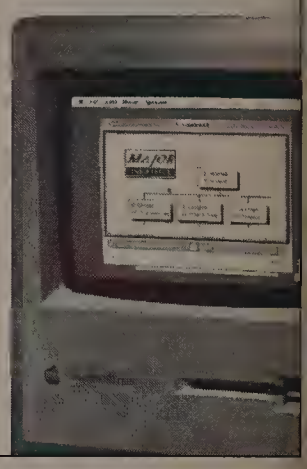

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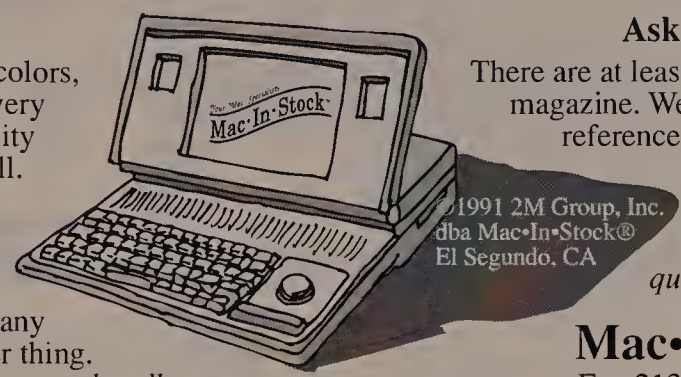

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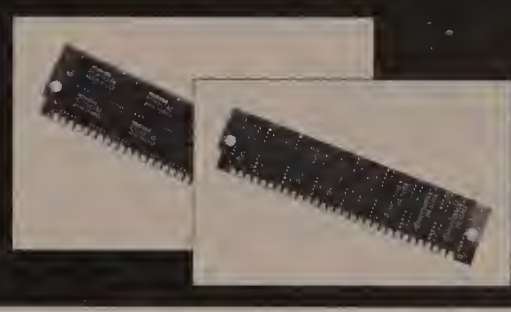

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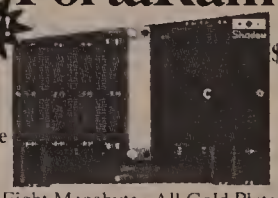

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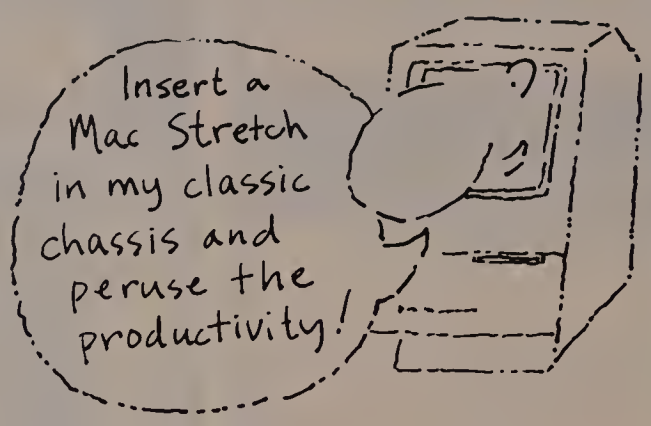

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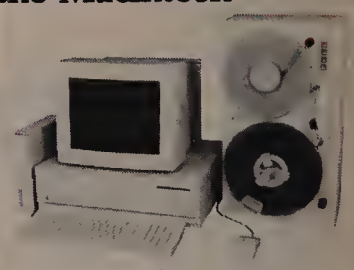

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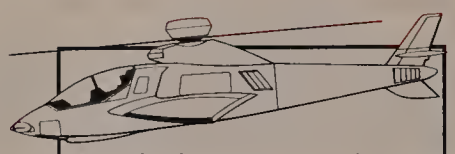

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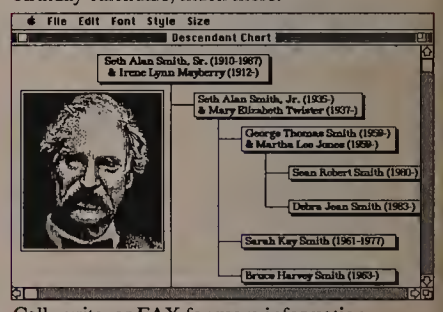

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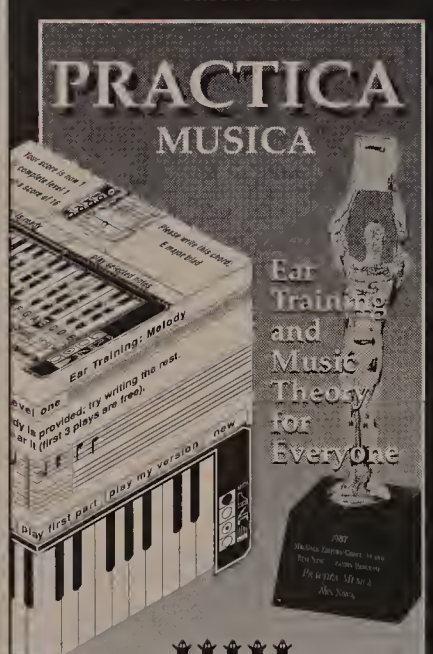

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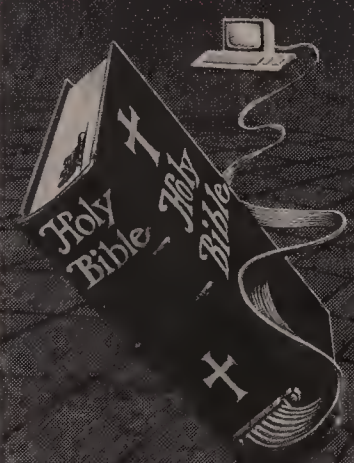

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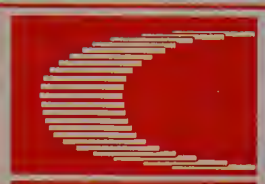

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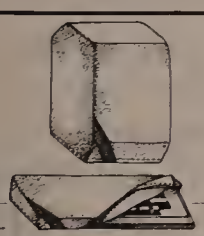

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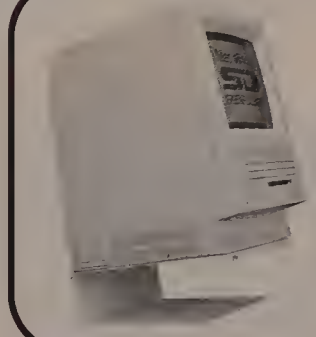

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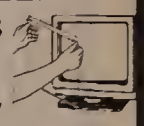

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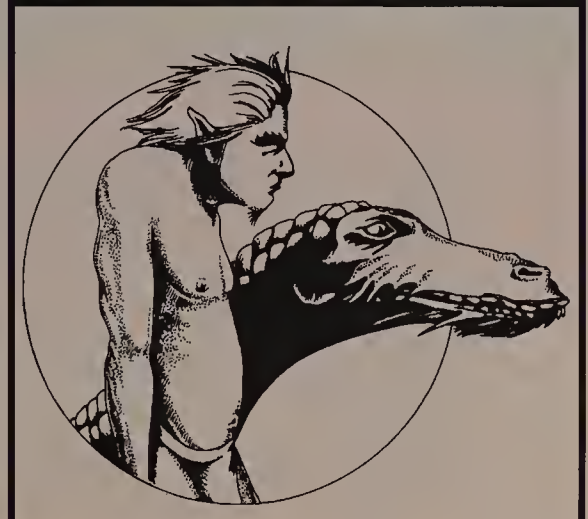

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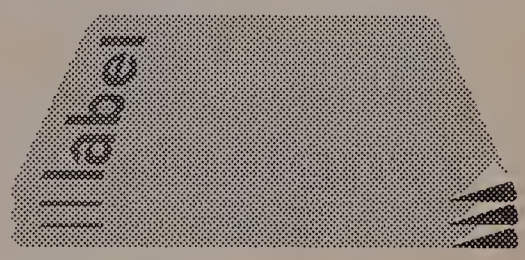

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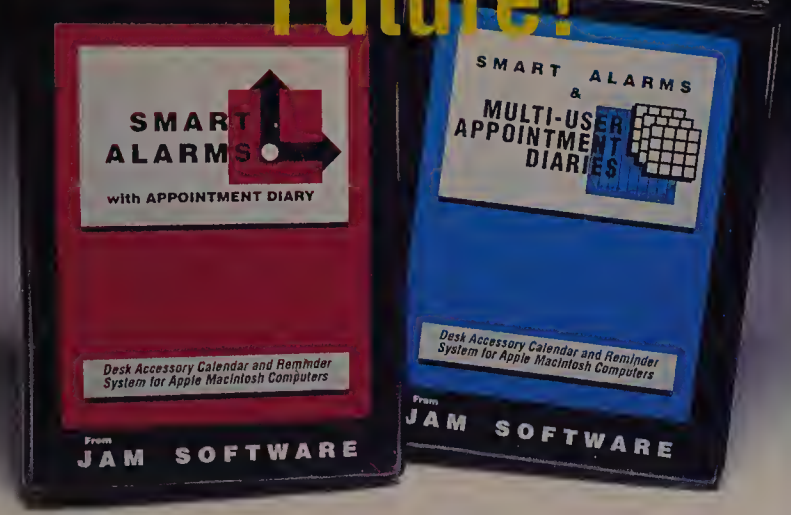

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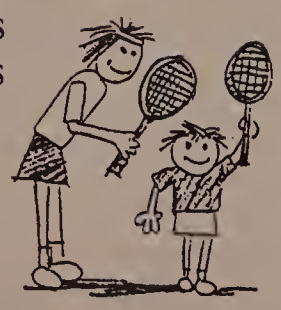

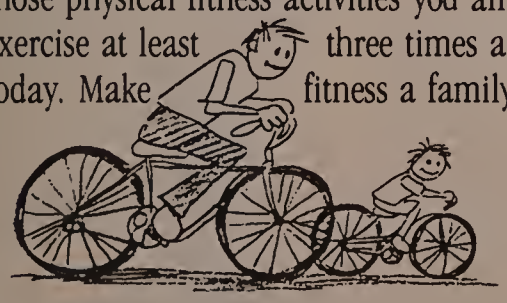

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BEST-SELLERS

BUSINESS SOFTWARE

Months on chart	Last month	This month		
69	1	1	**Microsoft Word**	Microsoft Corporation
60	3	2	**Microsoft Excel**	Microsoft Corporation
48	2	3	**Microsoft Works**	Microsoft Corporation
56	4	4	**Aldus PageMaker**	Aldus Corporation
21	6	5	**FileMaker II**	Claris Corporation
45	5	6	**MacWrite II**	Claris Corporation
8	—	7	**Quicken**	Intuit
22	7	8	**QuarkXPress**	Quark
53	10	9	**MacDraw II**	Claris Corporation
13	9	10	**Aldus FreeHand**	Aldus Corporation

EDUCATION SOFTWARE

Months on chart	Last month	This month		
4	2	1	**Where in Time Is Carmen Sandiego?**	Brøderbund Software
23	1	2	**Where in the World Is Carmen Sandiego?**	Brøderbund Software
36	3	3	**Reader Rabbit**	The Learning Company
10	4	4	**Where in the USA Is Carmen Sandiego?**	Brøderbund Software
12	—	5	**Math Rabbit**	The Learning Company

ENTERTAINMENT SOFTWARE

Months on chart	Last month	This month		
14	1	1	**SimCity**	Maxis Software
12	2	2	**Tetris**	Spectrum HoloByte
6	3	3	**Welltris**	Spectrum HoloByte
23	4	4	**Falcon**	Spectrum HoloByte
12	—	5	**Crystal Quest**	Casady & Greene

NETWORK/DATA COMMUNICATIONS

Months on chart	Last month	This month		
48	1	1	**TOPS**	Sitka Corporation
43	2	2	**AppleShare**	Apple Computer
5	3	3	**Timbuktu**	Farallon Computing
2	—	4	**White Knight**	FreeSoft
8	4	5	**MicroPhone II**	Software Ventures

MASS STORAGE*

Months on chart	Last month	This month		
12	5	1	**MacStack SD40**	CMS Enhancements
27	3	2	**MacStack SD20**	CMS Enhancements
14	4	3	**MacStack SD30**	CMS Enhancements
2	—	4	**Rodime 40 Plus**	Rodime Systems
1	—	5	**UltraDrive 45**	GCC Technologies

ADD-IN BOARDS/MEMORY

Months on chart	Last month	This month		
4	3	1	**Pivot**	Radius
28	2	2	**Apple 1MB Memory Expansion Kit**	Apple Computer
5	4	3	**Radius TPD Interface**	Radius
34	—	4	**Radius Accelerator**	Radius
3	1	5	**Macintosh Display Card 8•24**	Apple Computer

Months on chart	Last month	This month		
10	1	1	**SAM II**	Symantec Corporation
10	2	2	**SUM II**	Symantec Corporation
4	4	3	**Norton Utilities for the Macintosh**	Symantec Corporation
10	5	4	**Adobe Type Manager**	Adobe Systems
6	3	5	**Virex**	Microcom Software Division

PRODUCT WATCH

Recent or forthcoming products of particular interest.

Interleaf 5 *Interleaf*
Family of electronic publishing products

HappyBlaster *Pacific Rim Data Sciences*
Hardware device that enables non-PostScript printers to print PostScript files

Ray Dream Designer *Ray Dream*
3-D modeling package

Source: Exclusive InfoCorp survey of more than 125 Macintosh retailers and selected mail-order vendors. Covers sales during October1990.

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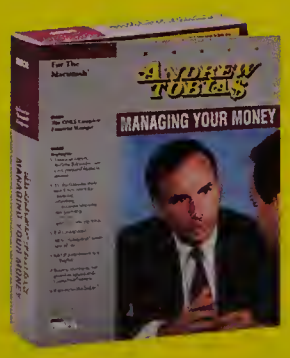

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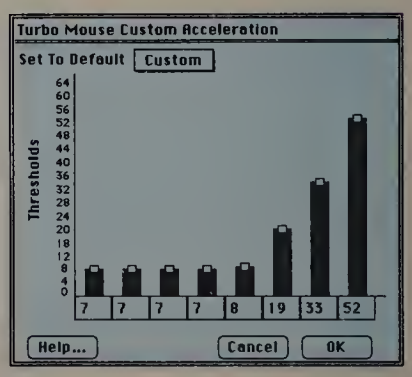

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